

PRIVATE
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MONTHLY NOTICES
OF THE
ROYAL ASTRONOMICAL SOCIETY.

VOL. LIV. No. 3. JANUARY 1894.

Fellows of the Society are informed that post-cards containing the titles of papers to be read at the evening meetings will be sent to those who shall express their wish to receive them. Fellows desiring to receive the post-cards are requested to send their names to the Assistant-Secretary, Mr. W. H. Wesley, Burlington House, London, W.

In order to enable the Secretaries to prepare complete lists in time for the issue of the post-cards, authors are particularly requested to send in their papers not later than the Tuesday preceding the day of meeting.

MONTHLY NOTICES
OF THE
ROYAL ASTRONOMICAL SOCIETY.

VOL. LIV.

JANUARY 12, 1894.

No. 3.

Lieut.-General TENNANT, C.I.E., R.E., F.R.S., Vice-President,
in the Chair.

William Briggs, B.A., LL.B., F.C.S., Burlington House,
Cambridge;

John Harrison Buckley, 70 Tower Street, Leicester;

John Evershed, jun., Kenley, Surrey;

Joshua Jukes, 43 High Street, Smethwick, near Birmingham;

Henry Alfred Lenehan, Astronomical Assistant, Government
Observatory, Sydney, Australia;

Armin Otto Leuschner, A.B., Assistant Professor of Astro-
nomy in the University of California, San Francisco;

Henry MacEwen, 5 Cathkin Terrace, Mount Florida, Glas-
gow;

Rev. David Powell Richards, B.A., Chaplain and Naval
Instructor to H.M.S. *Canada*, Bermuda;

Richard Pickering Sells, B.A., Astronomical Observer,
Government Observatory, Sydney, Australia;

Max Wolf, Ph.D., Professor of Astronomy in the University,
Heidelberg, Germany,

were balloted for and duly elected Fellows of the Society.

The following candidates were proposed for election as Fellows
of the Society, the names of the proposers from personal know-
ledge being appended:—

Augustin Stanislaus Ghosh, 28 Convent Road, Calcutta
(proposed by A. C. D. Crommelin);

Lieutenant William H. F. Montanaro, R.N., H.M.S. *Canada*,
Bermuda (proposed by Sir Josiah Rees);

Walter A. Post, Civil Engineer, Newport News, Virginia,
U.S.A. (proposed by S. W. Burnham);
Alexander William Roberts, Mathematical Master, Alice,
Lovedale, Cape Colony (proposed by David Gill).

Sixty-eight presents were announced as having been received since the last meeting, including, amongst others —

Bulletin du Comité International pour l'exécution photographique de la Carte du Ciel, tome ii., fasc. 2, presented by the French Academy; Ch. Dufour, La Scintillation des Etoiles, presented by the Author; German Transit of *Venus* Commission, Bericht über die deutschen Beobachtungen, herausgegeben von A. Auwers, Band V., presented by the Commission; F. Tisserand, Traité de Mécanique Céleste, tome iii., presented by the Author; Webb's Celestial Objects, new edition, vol. i., by the Rev. T. E. Espin, presented by the Publishers; Original negatives of *Jupiter*, and copies of Mr. Schaeberle's photographs of the Corona of 1893 April, presented by the Lick Observatory.

Mean Areas and Heliographic Latitudes of Sun-spots in the year 1891, deduced from Photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn (India), and in Mauritius.

(Communicated by the Astronomer Royal.)

The results here given are in continuation of those printed in the *Monthly Notices*, vol. lii., p. 24, and are deduced from the measurements of solar photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn, India, and at the Royal Alfred Observatory, Mauritius.

Table I. gives the mean daily areas of umbræ, whole spots, and faculæ for each synodic rotation of the Sun in 1891; and Table II. gives the same particulars for the entire year 1891, and for the two preceding years, for the sake of comparison. The areas are given in two forms. First, projected areas, that is to say, as seen and measured on the photographs, these being expressed in millionths of the Sun's apparent disc; and next, areas as corrected for foreshortening, the areas in this case being expressed in millionths of the Sun's visible hemisphere.

Table III. exhibits for each rotation in 1891 the mean daily area of whole spots, and the mean heliographic latitude of the spotted area, for spots north and for spots south of the equator, together with the mean heliographic latitude of the entire spotted area, and the mean distance from the equator of all spots; and Table IV. gives the same information for the year as a whole, similar results for 1889 and 1890 being added as in the case of

Table II. Tables II. and IV. are thus in continuation of the similar tables on pp. 381 and 382 of vol. xlix. of the *Monthly Notices*.

It will be noticed that the results for 1889 are also given in Table IV. in several parts. That year being the year of minimum, the spots during the earlier months were situated close to the equator, but after the minimum was passed, and the new cycle had commenced, spots appeared in much higher latitudes. No spots at all were seen either in the northern or southern hemisphere in the zones of mid-latitude; two zones, 8° broad, and having their centres in lat. 15° north and south respectively, being entirely barren. Up till June 28 not a single spot with a latitude over 11° was observed; on June 29 and 30 a small spot was seen in south lat. 40°. A second high latitude spot was seen on July 26, and they then began to become more numerous. On September 4 a small low latitude spot was seen for the last time, and for three months all the spots observed were in high latitudes. The year has therefore been divided into three periods: January 1 to June 28, when all the spots were in low latitudes; June 29 to September 4, when spots were seen both in high and low latitudes; and September 5 to December 31, when activity was almost entirely confined to the high latitude zones. And in each period the high and low latitude spots have been exhibited separately, the broad barren zone above alluded to marking off the two districts most unmistakably.

TABLE I.

No. of Rotation.	Date of Commencement of each Rotation.	No. of days on which Photographs were taken.	Mean of Daily Areas.					
			Umbræ.	Projected.		Corrected for Foreshortening		
				Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
498	Dec. 21 ¹⁸⁹⁰ 75	27	6.2	41.7	368	6.7	58.3	689
499	Jan. 18 ¹⁸⁹¹ 09	26	66.1	385	601	41.7	240	693
500	Feb. 14 43	27	67.0	353	641	50.9	270	714
501	Mar. 13 76	27	61.3	278	731	46.7	225	840
502	Apr. 10 05	27	72.9	444	760	56.9	370	888
503	May 7 30	27	142	825	1276	94.8	596	1256
504	June 3 51	28	131	865	1824	88.3	610	1600
505	June 30 71	27	246	1458	2183	183	1133	2336
506	July 27 91	27	92.4	670	1804	71.3	578	1917
507	Aug. 24 14	28	243	1608	1227	170	1207	1415
508	Sept. 20 41	27	159	1044	1990	117	823	2096
509	Oct. 17 69	27	67.3	422	1577	44.6	288	1710
510	Nov. 13 99	28	140	807	1513	95.4	593	1685
511	Dec. 11 31	27	183	1141	1792	129	864	1915

TABLE II.

Year.	No. of Days on which Photographs were taken.	Umbrae.	Projected. Whole Spots.	Mean of Daily Areas.			
				Faculae.	Umbrae.	Corrected for Foreshortening. Whole Spots.	Faculae.
1889	360	17.9	103	107	13.1	78.0	131
1890	361	21.3	133	273	15.5	99.4	304
1891	363	120	745	1322	86.2	569	1412

The rotations in Table I. and Table III. are numbered in continuance of Carrington's series (*Observations of Solar Spots made at Redhill*, by R. C. Carrington, F.R.S.), No. 1 being the rotation commencing 1853 November 9. The assumed prime meridian is that which passed through the ascending node at mean noon on 1854 January 1, and the assumed period of the Sun's sidereal rotation is 25.38 days. The dates of the commencement of the rotations are given in Greenwich civil time, reckoning from mean midnight.

TABLE III.

No. of Rota- tion.	Date of Com- mencement of each Rotation.	No. of Days on which Photo- graphs were taken.	Spots North of the Equator.		Spots South of the Equator.		Mean Heli- graphic Latitude of Entire Spotted Area.	Mean Distance from Equator of all Spots.
			Mean Photo- of Daily Areas.	Mean Heli- graphic Lati- tude.	Mean of Daily Areas.	Mean Heli- graphic Lati- tude.		
498	1890. d Dec. 21.75	27	9.7	23.22	48.6	26.33	- 18.11	25.81
499	1891. Jan. 18.09	26	105	18.86	135	26.86	- 6.78	23.35
500	Feb. 14.43	27	242	19.17	28	22.66	+ 14.84	19.53
501	Mar. 13.76	27	221	19.73	3.5	25.38	+ 19.02	19.81
502	Apr. 10.05	27	149	22.36	221	20.45	- 3.20	21.22
503	May 7.30	27	316	18.20	280	20.57	+ 0.01	19.31
504	June 3.51	28	486	18.40	124	19.32	+ 10.72	18.58
505	June 30.71	27	1049	19.67	84.4	20.87	+ 16.65	19.76
506	July 27.91	27	337	21.09	240	18.38	+ 4.66	19.96
507	Aug. 24.14	28	1175	21.47	32.3	22.69	+ 20.29	21.51
508	Sept. 20.41	27	400	20.78	423	18.64	+ 0.51	19.68
509	Oct. 17.69	27	284	18.29	3.9	19.22	+ 17.79	18.30
510	Nov. 13.99	28	219	19.48	374	18.78	- 4.67	19.04
511	Dec. 11.31	27	567	25.09	297	18.46	+ 10.12	22.81

The chief features of the Sun-spot record for 1891 as brought out by the preceding tables are:—(1) The great increase in the mean daily area of umbrae, whole spots and faculae; an increase which is proportionately about the same for the umbrae and whole spots, but not quite so strongly marked for the faculae. The ratios which the areas for 1891 bear to those of 1890 are 5.56 and 5.72 respectively in the two former cases, in the last case 4.65.

The minimum, therefore, has been evidently passed, and the new cycle is rapidly progressing towards full vigour.

(2) The high latitude occupied by the spots. The overwhelming majority have shown a latitude of more than 14° , less than 3 per cent. of the total spotted area lying nearer the equator than $13^{\circ}5$, whilst the mean distance from the equator of all spots has been $20^{\circ}31'$. This, though higher than the value for 1880, the corresponding year of the last cycle, was lower than that for 1890, and thus affords a second indication that the new cycle is in full action.

(3) A third feature is the predominance of spots in the northern hemisphere. If the precedent of the last cycle hold good, this also is typical of the earlier days of a new cycle. On the whole, therefore, the record for 1891 would indicate not merely that the minimum was past, and the rise towards maximum in full force, but also, from both the areas and latitude being greater than in 1880, and from the predominance of the northern hemisphere being more pronounced, that the approaching maximum will be more strongly marked than was the case with that of 1883.

TABLE IV.

Period.	No. of Days on which Photographs were taken.	Spots North of the Equator.		Spots South of the Equator.		Mean Helio-graphic Latitude of Entire Spotted Area.	Mean Distance from Equator of all Spots.
		Mean of Daily Areas.	Mean Helio-graphic Latitude.	Mean of Daily Areas.	Mean Helio-graphic Latitude.		
1889. Low Spots.							
Jan. 1-June 28	177	7.9	$5^{\circ}36'$	45.5	$5^{\circ}44'$	- $3^{\circ}85'$	$5^{\circ}43'$
June 29-Sept. 4	65	2.9	$2^{\circ}69'$	133.0	$7^{\circ}26'$	- $7^{\circ}05'$	$7^{\circ}16'$
Sept. 5-Dec. 31	118	0	...	5.0	$8^{\circ}73'$	- $8^{\circ}73'$	$8^{\circ}73'$
1889. High Spots.							
Jan. 1-June 28	177	0	...	0	...	...	...
June 29-Sept. 4	65	0	...	84.1	$21^{\circ}96'$	- $21^{\circ}96'$	$21^{\circ}96'$
Sept. 5-Dec. 31	118	1.8	$23^{\circ}94'$	30.0	$22^{\circ}95'$	- $20^{\circ}29'$	$23^{\circ}01'$
All Spots.							
1889	360	5.0	$7^{\circ}26'$	73.0	$11^{\circ}90'$	- $10^{\circ}68'$	$11^{\circ}61'$
1890	361	53.1	$22^{\circ}20'$	46.3	$21^{\circ}75'$	+ $1^{\circ}73'$	$21^{\circ}99'$
1891	363	40.1	$20^{\circ}49'$	169	$19^{\circ}91'$	+ $8^{\circ}52'$	$20^{\circ}31'$

*On the Dark Poles and Bright Equatorial Belt of the First
Satellite of Jupiter.* By E. E. Barnard, M.A.

It will, perhaps, be remembered that on 1890 September 8, while observing the transit of the first satellite of *Jupiter* with the 12-inch equatorial, the satellite appeared as a dusky elongated spot projected on a bright region of *Jupiter*. With a high power it appeared distinctly double, on a line nearly vertical to the belts of *Jupiter*. I called Mr. Burnham's attention to it, and we both saw it thus for upwards of half an hour. Subsequently it was seen several times when crossing a dark portion of the planet as a bright, very elongated spot, but the elongation in these cases was nearly parallel to the belts of *Jupiter*. Yet when closely examined on the sky it always appeared perfectly round.

An account of these observations will be found in *Monthly Notices*, vol. li., No. 9. To explain these singular peculiarities I at that time offered two theories: the first of these was that the satellite was itself possibly double. This idea has long since been abandoned because of its improbability. The second theory supposed the satellite to be surrounded with a white equatorial belt, and that its poles were dark or dusky, and that it rotated on an axis nearly perpendicular to its orbit. If such were the case, when the satellite crossed a bright portion of the planet the white belt would cut it apparently in two, as it would be equal in brightness to the surface of *Jupiter*, and thus leave the two dark polar caps as two separate spots nearly perpendicular to the belts of *Jupiter*, and would thus give the observed appearance of duplicity.

If, however, the satellite should happen to be projected on a dark belt, then the dark poles would merge into the surface of *Jupiter*, and the white equatorial belt alone would be visible as an elongated white spot nearly parallel to the belts of *Jupiter*.

It was not until this year (1893) that an opportunity occurred to settle this question with the 36-inch.

On September 25 last the transit of this satellite was watched with the great telescope. It first appeared as an elongated white spot, east and west, when over the dusky region near the planet's limb, and later it appeared as two dusky spots in a line north and south, exactly as it appeared in the 12-inch 1890 September 8. But during moments of good definition it was seen distinctly as a small round disc, dusky at the poles, and with a white belt between them.

On November 11 it was again observed under nearly similar conditions, and presented the same phenomena.

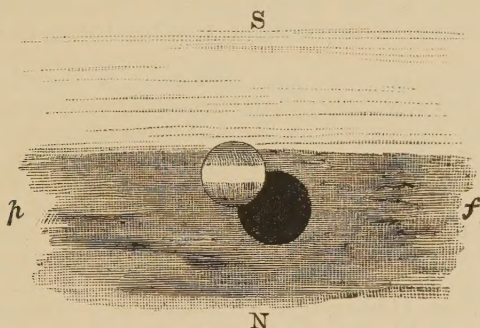
The best view of these dark polar caps and bright belt was had on November 19, with a power of 1,000 diameters on the great telescope, and almost perfect seeing.

At this transit the satellite partly obscured its own shadow on the south preceding side, and was partly projected on the southern edge of the south equatorial belt, and partly on the bright region beyond.

With the fine seeing the satellite presented a beautiful appearance. It stood out in bold relief like a little globe. The polar caps were heavily marked and quite dark, while the bright belt was very conspicuous.

The observation was perfectly satisfactory, and the second theory had become a fact.

I send a careful drawing of the appearance of the satellite on this date, which will give a good idea of the phenomenon. The shadow was larger than the satellite.



Transit of Satellite I., 1893 Nov. 19; 36-in. Refractor.

We have here established the discovery made 1890 September 8 with the 12-inch telescope, that this little attendant on *Jupiter* has distinct polar caps that are dusky like those of *Jupiter*, and that it has a bright equatorial belt, as bright as the brightest portion of *Jupiter's* surface. The conclusion is uncontested, therefore, that the satellite also rotates on an axis nearly perpendicular to its orbit, as *Jupiter* itself does.

From the fact that the bright belt is not always exactly parallel to those on *Jupiter*, and the line between the polar caps is not always exactly perpendicular to the belts of *Jupiter*, there must be a slight inclination of the axis of rotation of the satellite. From the fact also that the south cap is sometimes apparently a little smaller than the northern one, its axis is probably tipped away from us at its southern end. It is also probably tilted towards the west by a few degrees. From peculiarities in the appearance of the belt, it is probable that the period of rotation on this axis is not coincident with the satellite's period of revolution about *Jupiter*.

I have data in my hands now that will after a few more observations, perhaps, settle the inclination of the axis, and probably give us the period of rotation.

I think the presence of these dusky poles and bright belt would rather imply that this satellite at least is in a physical condition not vastly different from that of *Jupiter* itself.

Mount Hamilton, California:
1893 November 27.

Photograph of the Nebulæ H I 56 and 57 Leonis.
By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebulae H I 56 and 57 *Leonis*, R.A. $9^h 26^m$, Decl. $21^\circ 59'$ north, was taken with the 20-inch reflector on 1893, April 4, with exposure of the plate during 4 hours, and is enlarged to the scale of 1 millimètre to 24 seconds of arc.

The nebulae are Nos. 2903 and 2905 in the *New General Catalogue*, and 1861–1863 in the *General Catalogue*.

No. 1861 is described by Sir J. Herschel (*General Catalogue*, p. 79) as considerably bright, very large, extended, gradually much brighter in the middle, resolved; *s. p.* of 2. No. 1863 is described as very faint, considerably large, round, pretty suddenly brighter in the middle, resolved; *n. f.* of 2. These nebulae are figured in the *Phil. Trans.*, 1833, Pl. XV., fig. 70, p. 495, but the drawing does not at all resemble the photograph.

Lord Rosse (*Observations of Nebulae and Clusters of Stars*, pp. 76, 77, and Pl. III., fig. 9, 1851) gives the results of thirty observations of the nebula made between the years 1846 and 1878. A drawing is also given in the *Phil. Trans.* for 1850, Pl. XXXVI., fig. 3. The drawing, which was made in the year 1851, is in its outlines very fairly in agreement with the photograph, but of course the details of the extensions and condensations of the nebulous matter are not as shown on the photograph.

The photograph shows the nebula to be a symmetrical spiral, with great extensions of very faint nebulosity on the north and south sides. The nucleus is stellar in the centre of the convolutions of the spiral, which, owing to perspective effects, are elongated so as to appear of an elliptical form in nearly north and south directions. The convolutions of the spirals are broken up into nebulous star-like patches with faint nebulosity between them. On the negative the faint nebulosity is seen to extend further to the north and to the south than is shown on the print which is now presented.

The nebula H II 260 is also shown on the photograph $2^m 45^s$ following, and 13 minutes of arc north. It has a stellar nucleus resembling two faint stars surrounded by very faint nebulous rings.

It will be observed that the stars in the region of these nebulae are pretty numerous.

Photograph of the Nebula H I 200 Leonis Minoris.

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebula H I 200 *Leonis Minoris*, R.A. $8^h 46^m$, Decl. $33^\circ 49'$ north, was taken on 1893, March 19, with exposure of the plate during three hours. Scale: 1 millimètre = 24 seconds arc.

The nebula is No. 2683 in the *New General Catalogue*, and 1713 in the *General Catalogue*, and is described by Sir J. Herschel as very bright, very large, very much extended in the direction of $40^\circ 9'$, gradually much brighter in the middle.

Lord Rosse, in the *Observations of Nebulae and Clusters of Stars*, p. 70, gives the results of sixteen observations of the nebula made between the years 1851 and 1876. He describes it as a very large lenticular ray, slightly concave on the *n. p.* side, gradually very much brighter in the middle, perhaps $10'$ long, and he suspected the existence of very faint streaks and lanes on each side parallel to the ray.

The photograph shows the nebula with a strong stellar nucleus in the midst of dense nebulosity, which is of a flocculent character, and it is doubtless similar in form to the great nebula in *Andromeda*, but apparently very much smaller in size, and seen more edgewise; the rings are therefore not visible, though their existence is very probable. The nebula measures on the photograph about six and a half minutes of arc in length, and is in a region of the sky which is not exceptionally studded with stars; they are mostly faint, and are shown to about the 16th magnitude.

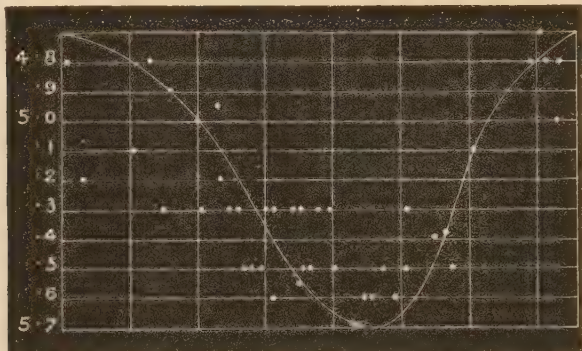
Observations of the Variable Stars W and X Sagittarii.

By Lieut.-Colonel E. E. Markwick.

W Sagittarii.—This star can be easily compared with No. 14 of *Sagittarius* in the *Uranometria Argentina*, 5.4 m., which is well situated for the purpose, as the binocular shows them nicely in the same field. The following observations were made with a binocular magnifying about five times. The observed magnitudes in the *U. A.* scale were plotted on ruled paper, in which the horizontal lines represent brightness, and the vertical ones the dates. The maxima, calculated from the data given in Mr. S. C. Chandler's valuable *Second Catalogue of Variable Stars*, viz. Epoch 1866 September 4 + 7.59460 E, were then marked by ordinates. A typical curve based on the same period and ($M-m$), the interval from minimum to next following maximum, = 3.00 days, was drawn on tracing-paper, and the differences

O—C read off on a scale of equal parts. Finally, the whole of the observations were plotted on the typical curve.

A diagram on these principles is attached. It will be seen that the dots have a curious tendency to range themselves in horizontal lines.



W Sagittarii. Typical Light-curve, with summarised Observations.

This *may* be due to the fact that the determinations of brightness were nearly all in tenths of a magnitude, and hence the dots *must* usually fall on some of the lines. But why they should cluster on the lines 5.4 and 5.6 I cannot say. It might be due either to systematic errors in determining the brightness, or to a real suspension or delay in the diminution of the star's brightness when it arrives near those magnitudes.

According to my estimates, the star varies between 4.8 m. and 5.7 m. Considering the large amount of probable error there is in estimating brightness, the observations seem to confirm the period well enough, those of July 31, August 31, and September 30 falling very close to the maximum lines. The hour of observation is only approximate to within five minutes, and is in G.M.T.

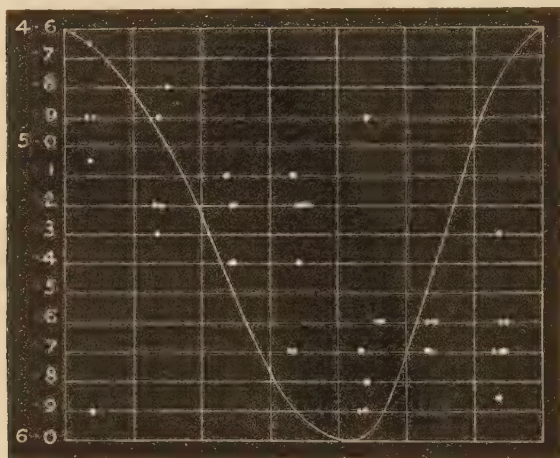
Both in the case of this and the following star I was quite ignorant, when making the observations, as to when the maxima were due, as I had not then calculated the dates, so the observations are free from any bias which such a knowledge might have produced.

W Sagittarii.

Date.		Observed brightness.	O—O d	Remarks.
1893				
July 19	h m 10 41	5.6	—0.3	
20	11 36	5.4	+1.2	
22	10 19	5.6	+0.6	
29	8 40	5.4	—0.7	Moonlight.
31	9 36	4.8	—0.5	Naked eye est.
31	11 35	4.9	+0.2	Binocular.

Date.		Observed	O—C	Remarks.
1893.	h m	brightness.	d	
Aug. 3	11 6	5.4	-0.3	
4	9 11	5.4	+0.3	
4	10 6	5.6	-0.1	
5	9 26	5.7	-0.6	
10	9 6	5.1	0.0	
10	10 51	5.4	-0.8	
11	8 46	5.6	-0.4	
11	10 16	5.4	+0.2	
12	9 0	5.6	+0.6	
15	9 21	4.9	-0.1	Clouds about.
16	9 5	5.3	-2.2	
17	9 36	4.9	+0.3	
18	9 56	5.3	-0.3	Moon.
20	9 36	5.4	-1.4	Strong Moon.
27	8 11	5.6	+0.3	Clouds and Moon.
28	9 9	5.6	-0.8	Moon.
31	9 6	4.9	+0.7	
Sept. 1	9 14	5.2	-1.2	
3	10 9	5.4	+0.3	
5	9 26	5.6	-0.4	Poor night.
9	8 32	5.4	-1.3	
10	7 56	5.4	-0.4	
11	7 36	5.4	+0.6	
11	9 6	5.65	0.0	
12	9 11	5.7	-0.6	
13	9 11	5.5	-0.1	
19	8 46	5.4	+1.1	Moonlight.
20	7 38	5.7	-0.3	
25	8 32	5.05	+0.6	
30	7 21	5.1	+1.0	On and after this date star getting low and comparison difficult.
30	8 47	4.9	+0.4	
Oct. 1	8 11	5.2	+2.2	
2	7 35	5.0	0.0	
3	8 46	5.6	-0.6	
6	7 55	5.5	0.0	
11	7 41	5.7	-0.6	
14	7 30	5.2	0.0	

X Sagittarii.—Observations of this star are not satisfactory, as it is difficult, to my eye, to determine its brightness with accuracy. I have generally compared it with *4 Sagittarii*, but when verging towards the west *4* is almost perpendicular above *X*, and atmospheric absorption must then affect the comparison of the two stars, as they are separated by an interval of 5° or so. This applies particularly to observations on and after September 25, which are given for what they are worth. According to my judgment, this star seems to vary between 4.6 and 6.0 mags., or thereabout, in the *U. A.* scale.



X Sagittarii. Typical Light-curve, with summarised Observations.

The maxima of the star, calculated from the period given in Chandler's Catalogue, happen, in 1893, very near midnight, every seven days, beginning, for my observations, on July 25. Hence the observations of July 31, August 15, 28, September 5, 11, 19, and October 2, being close to the maximum point, ought to be high in the scale—certainly above 5 m. But only two of these, viz. August 15 and September 12, show the star above 5.0 m., while those of September 11 and October 3 show it actually of nearly minimum brightness! I can only account for these discrepancies by errors in estimation of the brightness of the star. Curiously enough, the discs in this case when plotted on the curve have a tendency to run in *vertical* groups, as shown in annexed diagram. The observations were made in the same way as those of *W Sagittarii*, and are as follow :—

X Sagittarii.

Date.		Observed brightness.	O—C d	Remarks.
1893.				
July 19	h m 10 36	4.8	+0.5	
20	11 36	5.2	+0.6	
22	10 19	4.9	-1.6	Compared with 14 U.A. <i>Sagittarii.</i>
29	8 40	5.7	-0.6	
31	9 36	5.3	+0.7	Naked-eye view.
31	11 35	5.6	+1.2	
Aug. 3	11 6	5.4	+0.2	
4	9 11	5.4	+1.1	
4	10 6	5.2	+1.5	
5	9 26	5.6	-0.7	
10	10 51	5.2	+0.6	Observation hurried.
11	8 36	5.1	+1.7	
11	10 16	5.2	+1.5	
12	9 0	5.6	-0.7	
15	9 21	4.9	-0.8	
16	9 5	5.3	-0.7	
17	9 36	5.1	+0.7	Clouds.
18	9 56	5.7	+0.6	Moon.
20	9 36	5.7	+0.4	Moon and Clouds about.
28	9 9	5.6	+1.4	Moon.
31	9 6	5.4	+0.1	
Sept. 1	9 31	5.2	+1.5	
3	10 11	5.6	+0.3	
5	9 26	5.05	-1.2	Poor night.
9	8 34	5.8	-0.4	
10	7 56	5.6	+0.2	
11	7 36	5.85	+1.6	
11	9 6	5.7	+1.4	
12	9 11	4.65	0.0	
13	9 11	5.2	-0.5	
19	8 46	4.9	-0.8	Moon.
20	7 38	5.2	-0.6	
25	8 32	5.7	+1.3	Observation vague.
30	7 21	5.9	-0.4	
Oct. 1	8 11	5.7	+0.4	
2	7 37	5.7	+1.3	
3	8 46	5.9	-3.0	
6	7 55	5.7	+0.5	
11	7 41	4.9	+0.1	
14	7 30	5.9	-0.1	

Influence of the Full Moon on the Weather.

By the Rev. S. J. Johnson, M.A.

The theory that the Moon affects the weather has been long exploded, but the solitary observable effect of the Moon upon our atmosphere was believed by Sir J. Herschel to be exhibited in the disappearance of cloud under the full Moon, and this he attributed to the heat radiated from her surface. Humboldt speaks of this idea as well known to the pilots and seamen of Spanish America. M. Arago also spoke of more rain falling at the time of new Moon than at the time of full Moon. With a view of ascertaining whether clouds are more dispersed at the period of full Moon than previously, I have noticed the state of the sky at moonrise and at midnight on the day of full Moon for the past fifteen years, with the result that there is no foundation for the theory referred to.

Column 1 indicates sky similar when full Moon rose and at midnight.

2 = Clearer about midnight than at moonrise.

3 = More overcast about midnight.

Years.	1	2	3
1879	10 times	2 times	1 time
1880	6 "	4 "	2 times
1881	8 "	2 "	2 "
1882	5 "	4 "	4 "
1883	8 "	1 time	3 "
1884	9 "	2 times	1 time
1885	8 "	4 "	1 "
1886	7 "	3 "	2 times
1887	10 "	1 time	2 "
1888	11 "	0 "	1 time
1889	7 "	3 times	2 times
1890	10 "	2 "	1 time
1891	10 "	2 "	0 "
1892	7 "	3 "	2 times
1893	10 "	0 "	3 "
Totals	126	33	27

Melplash Vicarage, Bridport.

Observations of Brooks' Comet (c 1893), made at the Royal Observatory, Greenwich.

(Communicated by the Astronomer Royal.)

The observations were made with the East, or Sheepshanks, equatorial, aperture 6·7 inches, by taking transits over two cross-wires at right angles to one another, and each inclined 45° to the parallel of declination. Magnifying power, 55.

Greenwich Mean Solar Time.			Observer.	♂-★R.A.		Corr. for Refraction.	Log factor of Parallax.	♂-★N.P.D.	Corr. for Refraction.	Log factor Parallax.	No. of Comps.	Apparent R.A.			Apparent N.P.D.	Comp. Star.
d	h	m s		m	s							h	m	s		
1893. Dec.	7	6 3 23	B.	+3	6·06	-0·01	9·7558	-11 0·6	-0·7	0·8106	2	...	...	...	...	a
	7	6 16 8	"	+2	7·64	0·00	9·7346	+16 30·9	+1·2	0·8241	3	14 34	12 87	30	7 30·4	b
	7	6 18 33	"	+2	13·15	0·00	9·7304	+14 11·8	+1·1	0·8266	2	14 34	12 81	30	7 15·1	c
	9	8 42 1	H.	+0	44·94	0·00	9·2223	+2 29·6	+0·4	0·9015	4	14 47	59 40	27	46 50·3	d
	9	11 54 20	"	+1	45·35	0·00	9·6602	-5 49·6	-0·6	0·8566	3	14 48	59 81	27	38 30·1	d
	15	13 7 19	B.	+4	14·00	0·00	9·8548	+0 27·7	0·0	0·7784	6	15 41	12 49	21	26 7·6	e
	15	13 7 19	"	+2	53·00	+0·01	9·8548	-3 38·3	-0·2	0·7784	6	15 41	11 99	21	26 10·1	f
	15	14 10 37	"	-1	33·91	-0·02	9·9503	+4 13·2	+0·2	0·6914	5	15 41	42 21	21	23 39·6	g

Notes.

The observations are corrected for refraction, but not for parallax. They are also corrected for the error of inclination of the wires, and for the motion of the comet.
December 15.—The comet was brighter and more condensed than on December 7. Observations much interfered with by fleecy clouds.

The initials H. and B. are those of Mr. Hollis and Mr. Bryant respectively.

Comparison Stars.

Star's Name.	R.A. 1893'o. h m s	N.P.D. 1893'o. ° ' "	Authority.
<i>a</i> Anonymous	14 31 7	30 18'6"	Difference from star <i>b</i> .
<i>b</i> B.D. + 60°; 1552	14 32 5'23	29 50 30'0	Helsingfors Gotha Ast. Gesell. Catalogue.
<i>c</i> B.D. + 60°, 1551	14 31 59'66	29 52 33'9	" "
<i>d</i> B.D. + 62°; 1370	14 47 14'85	27 43 52'1	" "
<i>e</i> B.D. + 68°; 844	15 37 0'62	21 25 13'8	Christiania Ast. Gesell. Catalogue.
<i>f</i> B.D. + 68°; 846	15 38 21'12	21 29 22'6	" "
<i>g</i> B.D. + 68°; 849	15 43 18'46	21 19 0'8	" "

Royal Observatory, Greenwich:
1894 January 9.

Observations of Occultations of Stars by the Moon, and of Phenomena of Jupiter's Satellites, made at the Royal Observatory, Greenwich, in the Year 1893.

(Communicated by the Astronomer Royal.)

Occultations of Stars by the Moon.

Day.	Phenomenon.	Telescope.	Power.	Moon's limb.	Mean Solar Time of Observation.	Observer.
					h m s	
1893 Feb. 26	Disapp. ϵ Geminorum	Merz. Refractor	418	Dark	9 58 35.05	L.
Apr. 18	" 32 Tauri	Astrographic Equat.	225	"	9 6 59.60	C. D.
18	" 32 Tauri	E. Equat.	55	"	9 7 0.30	A. C.
18 (a)	" B.D. + 22° No. 602.	Astrographic Equat.	225	"	8 57 32.95	C. D.
18 (b)	" B.D. + 22° No. 606	"	"	"	9 7 46.77	"
19 (c)	" B.D. + 25° No. 762	Altaz.	100	"	8 13 (3.24)	H.
19	" B.D. + 25° No. 762	Astrographic Equat.	225	"	8 13 13.76	C. D.
19 (d)	" W.B. (2) IV. 1,144	Altaz.	100	"	8 39 35.08	H.
19	" W.B. (2) IV. 1,144	Astrographic Equat.	120	"	8 39 34.87	C. D.
19 (e)	" W.B. (2) IV. 1,142	Altaz.	100	"	8 43 46.88	H.
19	" W.B. (2) IV. 1,142	Astrographic Equat.	120	"	8 43 48.58	C. D.
20	" B.D. + 27° No. 963 (1st ★)	"	"	"	7 56 11.02	"
20 (f)	" B.D. + 27° No. 964	"	"	"	8 3 9.57	"
20	" B.D. + 27° No. 966	Merz. Refractor	418	"	8 9 1.24	L.

Day.	Phenomenon.	Telescope.	Power.	Moon's limb.	Mean Solar Time of Observation. h m s	Observer.
1893 Apr. 20	Disapp. B.D. + 27° No. 966	Astrographic Equat.	120	Dark	8 9 0'93	C. D.
20	" B.D. + 27° No. 966	3-in. Finder of Merz. Refractor	50	"	8 9 1'02	D. E.
20	" B.D. + 27° No. 994	E. Equat.	70	"	9 43 5'55	C. D.
21	" 47 Geminorum	2½-in. Finder of E. Equat.	24	"	9 17 35'21	H. T.
21	" 47 Geminorum	Altaz.	100	"	9 17 35'60	B.
21	" 47 Geminorum	E. Equat.	...	"	9 17 35'31	J.
21 (g)	" W.B. (2) VII. 318	Altaz.	100	"	12 39 9'00	B.
22	" λ Cancri	E. Equat.	70	"	12 34 53'22	A. C.
May 6	Reapp. δ Sagittarii	"	"	"	16 16 17'51	H.
18	Disapp. B.D. + 27° No. 1,226	Astrographic Equat.	120	"	8 53 22'80	C. D.
18	" B.D. + 27° No. 1,229	"	"	"	9 8 20'74	"
18	" W.B. (2) VI. 1,192-3	"	"	"	9 21 46'77	"
18	" B.D. + 27° No. 1,237	"	"	"	9 31 44'53	"
27 (h)	" B.D. - 15° No. 3,862	"	"	"	9 37 39'44	"
June 20	" B.D. + 2° No. 2,499	"	225	"	10 13 27'71	H. F.
20	" B.D. + 2° No. 2,499	Altaz.	60	"	10 13 27'98	C. D.
July 9 (i)	" 32 Tauri	"	100	Bright	13 37 14'84	B.
'9	Reapp. 32 Tauri	"	"	Dark	14 27 29'93	"
9	" 32 Tauri	Astrographic Equat.	225	"	14 27 29'78	A. E.

Day.	Phenomenon.	Telescope.	Power.	Moon's limb.	Mean Solar Time of Observation.	Observer.
1893 July 30	Reapp. ζ Aquarii	Astrographic Equat.	225	Dark	h m s 10 25 18.58	H. F.
Sept. 26 (<i>j</i>)	" ϵ Piscium	"	"	"	7 11 1.47	"
Oct. 19	Disapp. 37 Capricorni	E. Equat.	55	"	9 3 22.84	B.
19	" 38 Capricorni	Astrographic Equat.	225	"	9 5 10.26	C. D.
25 (<i>k</i>)	" 40 Arietis	E. Equat.	55	Bright	15 8 44.38	C. M.
30 (<i>l</i>)	Reapp. ω^2 Cancri	Altaz.	100	Dark	11 44 29.72	B.
30	" ω^2 Cancri	E. Equat.	55	"	11 44 29.47	C. D.
Nov. 22	Disapp. δ Arietis	"	"	"	10 19 (36.54)	L.
22 (<i>m</i>)	" δ Arietis	Astrographic Equat.	225	"	10 19 46.80	H. F.
22	" δ Arietis	Altaz.	100	"	10 19 45.89	D. E.
Dec. 14	" B.D. - 14° No. 6,301	Astrographic Equat.	225	"	5 42 29.97	C. D.

Notes.

(a) Limb distinctly seen.

(b) Difficult observation.

(c) The dark limb was quite visible and the star disappeared at above time, but there was a momentary flash about 10 secs. later, as though the star was seen through the limb.

(d) The star appeared to disappear behind limb at 10^h 31^m 48^s.5, and was then repeatedly seen again as though through limb; it was last seen at above time.

(e) There was a cloud over the moon which had previously obscured the star; this is not considered a good observation; the star was difficult to see.

(f) Poor observation; very faint; cloudy.

(g) A very difficult observation.

(h) Not considered a good observation.

(i) Not considered a good observation.

(j) Limb nearly full, so probably a little late.

(k) Disappeared in blue rim of moon.

(l) A rough observation.

(m) Bright and instantaneous.

Phenomena of Jupiter's Satellites.

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation.		Mean Solar Time of N.A.	Observer.
					h	m	s	
1893 Jan. 2	III.	Tr. Ing. First contact	E. Equat.	200	8	35	53	A. C.
	III.	Bisection	"	"	8	40	8	"
	III.	Last contact	"	"	8	43	12	"
	III. (a)	Tr. Ing. First contact	Astrographic Equat.	225	8	38	38	A. E.
	III.	Bisection	"	"	8	42	7	"
	III.	Last contact	"	"	8	55	5	"
	I. (b)	Tr. Ing. First contact	"	"	9	0	47	C. D.
	I.	Last contact	"	"	9	4	39	"
	I.	Tr. Ing. Bisection	Merz. Refractor	130	7	25	25	B.
	I.	Last contact	"	"	7	29	58	"
	I.	Tr. Ing. Last contact	E. Equat.	200	7	28	58	T. H.
	I. (c)	Occ. D. Bisection	Merz. Refractor	295	6	44	30	L.
27	I.	Last seen	"	"	6	45	10	"
	I. (d)	Occ. D. First contact	E. Equat.	200	6	40	24	H.
	I.	Bisection	"	"	6	41	59	"
	I.	Last seen	"	"	6	44	33	"
	I. (e)	Occ. D. Last seen	Altaz.	100	6	44	19	B.
	I.	Tr. Ing. First contact	Merz. Refractor	285	5	50	15	L.
	I.	Bisection	"	"	5	51	58	"
	I.	Last contact	"	"	5	54	14	"
Feb. 4								
4								
4								

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
1893 Feb. 4	I.	Tr. Ing. First contact	E. Equat.	200	5 45 58		D. E.
4	I.	Bisection	"	"	5 47 47	5 50	"
4	I.	Last contact	"	"	5 49 57		"
4	I.	Tr. Egr. First contact	Altaz.	100	8 6 25	8 5	B.
4	I. (f)	Last contact	"	"	8 8 28		"
4	I.	Tr. Egr. First contact	E. Equat.	200	8 1 25		D. E.
4	I.	Bisection	"	"	8 3 55	8 5	"
4	I.	Last contact	"	"	8 6 5		"
4	I.	Ecl. R. First seen	"	"	6 35 24	6 35 1	A. C.
5	I. (g)	Full brightness	"	"	6 36 51		"
5	I.	Ecl. R. Full brightness	Astrographic Equat.	225	6 35 49	6 35 1	H. F.
5	I.	Tr. Egr. First contact	E. Equat.	200	7 55 22		H.
7	III.	Bisection	"	140	8 0 21	7 57	"
7	III.	Last contact	"	"	8 3 31		"
7	III.	Occ. D. Bisection	"	100	7 11 54	7 12	"
19	I.	Last seen	"	"	7 13 49		"
19	I.	Occ. R. First seen	"	"	6 40 28		"
25	III.	Bisection	"	"	6 42 17	6 44	"
25	III.	Last contact	"	"	6 44 47		"
25	III.	Ecl. R. First seen	Finder of Merz. Refractor	50	6 50 58	6 50 11	L.
28	I. (h)	Full brightness	"	"	6 52 56		"
28	I.						

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s.	Mean Solar Time of N.A. h m s.	Observer.
1893 Feb. 28	I. (<i>i</i>)	Ecl. R. First seen	Astrographic Equat.	225	6 50 22		C. D.
28	I.	Bisection	"	"	6 51 37	6 50 11	"
28	I.	Full brightness	"	"	6 53 22		"
Mar. 23	I.	Ecl. R. First seen	E. Equat.	100	7 4 53	7 4 27	H.
23	I.	Full brightness	"	"	7 6 52		"
23	I. (<i>j</i>)	Ecl. R. First seen	Astrographic Equat.	225	7 5 9		C. D.
23	I.	Bisection	"	"	7 5 59	7 4 27	"
23	I.	Full brightness	"	"	7 7 9		"
July 5	I. (<i>k</i>)	Ecl. D. Began to fade	"	"	15 2 29		"
5	I.	Bisection	"	"	15 3 29	15 3 48	"
5	I.	Last seen	"	"	15 4 21		"
22	III.	Tr. Egr. Bisection	"	"	13 48 46		"
22	III.	Last contact	"	"	13 51 40	13 54	"
22	I.	Tr. Egr. First contact	"	"	13 56 59		"
22	I.	Bisection	"	"	15 59 14	14 3	"
22	I.	Last contact	"	"	14 1 58		"
Aug. 14	I. (<i>l</i>)	Tr. Ing. Last contact	E. Equat.	200	12 5 0	12 10	B.
14	I.	Tr. Egr. Bisection	Astrographic Equat.	225	14 18 59		C. D.
14	I.	Last contact	"	"	14 20 14	14 21	"
15	I.	Occ. R. First seen	E. Equat.	275	11 33 18		L.
15	I. (<i>m</i>)	Last contact	"	"	11 35 57	11 30	"

Jan. 1894.

of Jupiter's Satellites, 1893.

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Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
1893 Aug. 24	II.	Ecl. D. Last seen	Altaz.	100	13 38 58	13 39 41	B.
Sept. 3	III.	Tr. Ing. First contact	Astrographic Equat.	225	12 46 43		C. D.
3	III.	Bisection	"	"	12 57 11	12 51	"
3	III.	Last contact	"	"	13 9 14		"
4	II. (H)	First seen	Altaz.	100	10 42 12	10 31	H.F.
4	II.	Last contact	"	"	10 46 21		"
5	I. (o)	Ecl. D. Began to fade	Astrographic Equat.	225	13 36 55	13 39 18	C.D.
5	I.	Bisection	"	"	13 38 33		"
5	I.	Last seen	"	"	13 40 13		"
7	I. (p)	First seen	"	"	11 35 25	11 37	H.F.
7	I.	Bisection	"	"	11 36 20		"
7	I.	Last contact	"	"	11 39 10		"
11	II.	First contact	"	"	10 44 30	10 45	A.E.
11	II.	Last seen	"	"	10 47 14	10 1 41	"
14	I. (g)	Ecl. D. Last seen	"	"	10 2 5	10 1 41	C.D.
22	I.	Tr. Ing. First contact	E. Equat.	360	10 24 40	10 26	A.C.
22	I.	Bisection	"	"	10 26 21		"
22	I.	Last contact	"	"	10 28 7		"
22	I.	Tr. Egr. First contact	"	"	12 31 23	12 37	"
22	I.	Bisection	"	"	12 33 7		"
22	I.	Last contact	"	"	12 34 56		"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation.	Mean Solar Time of N.A.	Observer.
1893 Sept. 23	I. (r)	Occ. R. Bisection	E. Equat.	70	h m s 9 52 41	h m s 9 45	H.
23	I.	Last contact	"	"	9 55 11		"
25	II.	Ecl. D. Last seen	"	"	13 18 5	13 20 4	D. E.
27	II.	Tr. Egr. First contact	"	200	11 56 22		H.
27	II.	Bisection	"	"	11 58 47	12 1	"
27	II.	Last contact	"	"	12 3 0		"
30	I. (s)	Occ. R. First seen	"	"	11 31 27		O. T.
30	I.	Bisection	"	"	11 32 37	11 33	"
30	I.	Last contact	"	"	11 34 11		"
Oct. 4	II.	Tr. Ing. First contact	"	"	12 4 23	12 9	A. C.
4	II.	Bisection	"	"	12 7 6		"
4	II.	Last contact	"	"	12 12 0		"
6	II. (t)	Occ. R. First seen	"	"	9 26 40	9 26	D. E.
22	II.	Tr. Egr. First contact	Astrographic Equat.	225	8 10 9		C. D.
22	II.	Bisection	"	"	8 11 43	8 13	"
22	II.	Last contact	"	"	8 14 23		"
22	I.	Tr. Ing. First contact	"	"	11 57 46		"
22	I.	Bisection	"	"	12 0 11	11 59	"
22	I.	Last contact	"	"	12 2 45		"
22	I.	Sh. Egr. First contact	"	"	13 27 32		"
22	I.	Bisection	"	"	13 29 13	13 30	"
22	I.	Last contact	"	"	13 30 11		"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
1893 Oct. 24	I. (<i>u</i>)	Tr. Egr. First contact	E. Equat.	200	8 29 53	8 36	L.
24	I.	Last contact	"	"	8 35 52		"
27	II. (<i>v</i>)	Ecl. D. Last seen	"	"	12 57 57	12 58 6	B.
31	I. (<i>w</i>)	Tr. Ing. Last contact	Astrographic Equat.	225	8 13 58	8 9	C. D.
31	I. (<i>x</i>)	Tr. Egr. First contact	"	"	10 12 39		D. E.
31	I.	Bisection	"	"	10 16 23	10 20	"
31	I.	Last contact	"	"	10 18 33		"
Nov. 3	III. (<i>y</i>)	Ecl. R. Full brightness	E. Equat.	100	6 39 8	6 40 21	A. C.
3	III.	Occ. D. First contact	"	"	6 42 59		"
3	III.	Bisection	"	"	6 52 42	6 52	"
3	III. (<i>z</i>)	Last seen	"	"	7 6 15		"
6	I.	Ecl. D. Began to fade	"	"	12 11 16		L.
6	I.	Half brightness	"	"	12 15 46		"
6	I.	Quarter brightness	"	"	12 18 5	12 18 57	"
6	I.	Last seen	"	"	12 19 15		"
6	I.	Ecl. D. Last seen	Astrographic Equat.	225	12 19 28	12 18 57	A. E.
9	I. (<i>a'</i>)	Tr. Egr. First contact	"	"	6 25 52		H. F.
9	I.	Bisection	"	"	6 27 57	6 29	"
9	I.	Last contact	"	"	6 30 12		"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation.	Mean Solar Time of N.A.	Observer.
1893 Nov. 16	I.	Tr. Egr. Bisection	E. Equat.	100	8 12 14	8 13	H.
	I.	Last contact	"	"	8 13 59		"
	I.	Tr. Egr. Bisection	Altaz.	"	8 11 7	8 13	C. D.
	I.	Last contact	"	"	8 13 21		"
	I.	Occ. D. First contact	E. Equat.	"	10 28 2	10 29	L.
	I.	Last seen	"	"	10 31 6		"
	I. (b')	Occ. D. First contact	Astrographic Equat.	225	10 26 14		H. F.
	I.	Bisection	"	"	10 29 18	10 29	"
	I.	Last seen	"	"	10 30 55		"
	I. (c')	Occ. D. First contact	Altaz.	100	10 25 44	10 29	D. E.
	I.	Bisection	"	"	10 27 44		"
	I.	Last seen	"	"	10 29 35		"
	II.	Tr. Ing. Bisection	E. Equat.	"	8 39 57	8 42	H.
	II.	Last contact	"	"	8 42 37		"
	II. (d')	Tr. Ing. First contact	Astrographic Equat.	225	8 36 14	8 42	C. D.
	II.	Bisection	"	"	8 38 56		"
Dec. 7	II.	Last contact	"	"	8 41 33		"
	II.	Tr. Egr. First contact	E. Equat.	100	10 52 36	10 59	H.
	II.	Bisection	"	"	10 55 35		"
	II.	Last contact	"	"	10 59 19		"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
1893 Dec. 7	II.	Tr. Egr. First contact	Astrographic Equat.	225	10 50 12	10 59	C. D.
7	II.	Bisection	"	"	10 53 12		"
7	II.	Last contact	"	"	10 56 16		"
7	I.	Tr. Ing. First contact	E. Equat.	100	11 9 18	11 12	H.
7	I.	Bisection	"	"	11 11 32		"
7	I.	Last contact	"	"	11 14 42		"
7	I.	Tr. Ing. First contact	Astrographic Equat.	225	11 11 35	11 12	C. D.
7	I.	Bisection	"	"	11 13 50		"
7	I.	Last contact	"	"	11 16 29		"
7	II.	Sh. Egr. Bisection	"	"	11 56 53	12 0	"
7	II.	Last contact	"	"	11 59 2		"
9	II.	Ecl. R. First seen	E. Equat.	100	6 43 13	6 42 57	B.
9	II. (e')	Ecl. R. First seen	Astrographic Equat.	225	6 43 1		H. F.
9	II.	Bisection	"	"	6 44 46		"
9	II.	Full brightness	"	"	6 46 55	7 50	"
9	I.	Tr. Egr. Last contact	"	"	7 52 40		"
14	II.	Tr. Ing. Bisection	E. Equat.	200	10 59 9	11 0	C. D.
14	II.	Last contact	"	"	11 2 43		"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation.	Mean Solar Time of N.A.	Observer.
1893 Dec. 14	I.	Tr. Ing. First contact	E. Equat.	200	h m s 12 56 51		C. D.
14	I.	Bisection	"	"	12 58 44	12 57	"
14	I.	Last contact	"	"	13 1 23		"
14	II.	Tr. Egr. Last contact	"	"	13 17 1	13 18	"
15	I.	Ecl. R. First seen	"	275	13 0 8	13 0 31	B.
16	II. (g')	Ecl. R. First seen	"	100	9 18 21		L.
16	II.	Bisection	"	"	9 19 36	9 18 21	"
16	II.	Full brightness	"	"	9 20 56		"
16	I.	Tr. Egr. First contact	"	"	9 32 19		L.
16	I.	Last contact	"	"	9 35 39	9 35	"
22	I.	Occ. D. First contact	"	55	11 54 11		W. B.
22	I.	Bisection	"	"	11 55 41	11 56	"
22	I.	Last seen	"	"	11 56 56		"
23	III.	Occ. R. Last contact	"	100	7 23 0	7 27	A. C.
23	II.	Occ. D. First contact	"	"	7 53 10		"
23	II.	Bisection	"	"	7 55 23	7 56	"
23	II.	Last seen	"	"	7 57 41		"
23	I. (g')	Tr. Ing. First contact	Transit Circle	195	9 9 49		"
23	I.	Last contact	E. Equat.	100	9 14 3	9 9	"
23	III. (h')	Ecl. D. Last seen	"	"	9 17 30	9 15 31	"

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation.	Mean Solar Time of N.A.	Observer.
1893 Dec. 30	III.	Occ. D. First contact	E. Equat.	100	h m s	h m	W. B.
30	III.	Bisection	"	"	9 15 15	9 16	"
30	III.	Last contact	"	"	9 17 0		"
30	I.	Tr. Ing. First contact	"	"	9 19 14		"
30	I.	Bisection	"	"	10 58 18	10 57	"
30	I.	Last contact	"	"	10 59 28		"
30	I.		"	"	11 0 58		"

Notes.

- (a) Image tremulous, windy.
 (b) A bad observation. *Jupiter* very faint; satellite almost invisible; both times uncertain.
 (c) Very good observation. (d) Bad observation, probably late. (e) Very rough observation. (f) Bad observation.
 (g) Good observation. (h) A good observation, at 6^h 52^m 12^s brightness equal to, and at 6^h 52^m 39^s brightness greater than, that of
 Satellite IV. (i) Sky hazy. (j) Bad observation; definition very poor. (k) Nearly daylight.
 (l) Bad definition. (m) This observation is of little value. Could get no definite limb on *Jupiter*, and the satellite was
 very faint. Times probably half a minute late. (n) Definition very bad. Observation not worth much. (o) Definition very poor.
 (p) Definition of *Jupiter* rather poor. (q) Definition bad. (r) Not a good observation. (s) *Jupiter's* limb rather hazy.
 (u) Not a good observation. Satellite seen through thin cloud. (v) Definition not good. Very hazy.
 (w) Cloudy. (x) Definition bad. (y) Reappeared almost in contact with *Jupiter*; probably late.
 (z) Rough observation, through a momentary break in clouds. (a') Definition poor. (b') Considered good observation. Definition
 very good. (c') Very little use, no definition; probably late. (d') Definition poor. (e') Definition good.
 (f') Very good observation. (g') Observed as *Jupiter* was crossing the first wire. (h') Not a good observation. Very misty.

The initials H. T., L., H., A. C., B., T. H., H. F., C. M., C. D., D. E., W. B., O. T., and A. E., are those of Mr. Turner, Mr. Lewis, Mr. Hollis, Mr. Crommelin, Mr. Bryant, Mr. Hudson, Mr. Furner, Mr. Martin, Mr. Davidson, Mr. Edney, Mr. Bowyer, Mr. Tuck, and Miss Everett respectively.

Ephemerides of the Five Inner Satellites of Saturn, 1894.
By A. Marth.

Greenwich Noon,	P	L	B	B	$\Delta - L$	Long. of Centr. Mer.	B'
1894. Feb. 20	358°520	203°765	+13°954	+12°250	-4°485	117°54	+15°43
25	'502	203°609	13°869	12°315	4°178	22°01	15°34
Mar. 2	'480	203°416	13°770	12°380	3°833	286°49	15°23
7	'454	203°189	13°658	12°445	3°454	190°98	15°11
12	'423	202°931	13°535	12°510	3°044	95°47	14°97
17	'389	202°646	13°402	12°575	2°607	359°95	14°83
22	'353	202°337	13°261	12°640	2°146	264°42	14°67
27	358°315	202°008	13°113	12°705	-1°666	168°88	14°51
Apr. 1	'275	201°664	12°961	12°770	1°170	73°32	14°34
6	'233	201°310	12°806	12°835	0°663	337°73	14°17
11	'191	200°950	12°651	12°900	-0°151	242°11	14°00
16	'149	200°589	12°497	12°965	+0°362	146°46	13°83
21	'108	200°233	12°347	13°029	0°870	50°76	13°67
26	'068	199°885	12°203	13°094	1°370	315°02	13°51
May 1	358°029	199°550	+12°066	+13°159	+1°858	219°23	+13°36
6	357°992	199°232	11°938	13°243	2°328	123°39	13°22
11	'958	198°936	11°821	13°287	2°776	27°49	13°09
16	'927	198°665	11°717	13°351	3°200	291°54	12°97
21	'899	198°421	11°626	13°415	3°596	195°53	12°88
26	'875	198°207	11°550	13°479	3°962	99°46	12°79
31	'854	198°026	11°490	13°542	4°295	3°34	12°73
June 5	357°837	197°881	11°447	13°606	+4°593	267°16	12°68
10	'824	197°772	11°420	13°669	4°855	170°92	12°65
15	'816	197°700	11°411	13°732	5°080	74°63	12°64
20	'812	197°666	11°419	13°795	5°267	338°29	12°65
25	'812	197°670	11°445	13°858	5°415	241°90	12°68
30	'817	197°713	11°488	13°921	5°525	145°46	12°73
July 5	'826	197°794	11°548	13°984	5°597	48°98	12°79
10	357°840	197°913	+11°624	+14°047	+5°631	312°46	+12°87

P denotes the position-angle of the axis of *Saturn*; $L + 180^\circ$ the planetocentric longitude of the Earth referred to the assumed

plane of the planet's equator; $\Lambda + 180^\circ$ that of the Sun, or $\Lambda - L$ the difference between the two. B and B' denote the planetocentric latitudes of the Earth and Sun above the assumed plane.

The longitudes of *Saturn's* central meridian depend on the values adopted in the ephemeris for 1893. The various surface markings, observed by Mr. A. S. Williams during the last apparition of the planet, indicate such variations in the rate of motion that, for the present, it seemed the safer course not to make any alteration. The adopted daily rate of rotation is $844^\circ 80'$, corresponding to a period of $10^h 13^m 63.6$. The differences between successive values of the longitude of the central meridian, for the interval of five days, vary between $4223^\circ 48'$ and $4224^\circ 49'$.

If on the planet's spheroidal surface, ω is the longitude of a marking, ω_0 that of the central meridian, β the planetocentric latitude of the marking, a and b the semi-axes of the apparent disc as seen from a distant point in planetocentric latitude B , the apparent co-ordinates of the marking, referred to the axes of the disc, will be

$$s \sin (p - P) = x = a \cos \beta' \sin (\omega - \omega_0)$$

$$s \cos (p - P) = y = b \sin (\beta' - B') + x \sin B \tan \frac{1}{2} (\omega - \omega_0),$$

wherein

$$\tan \beta' = \tan \beta \cdot \sec \epsilon_0$$

$$\tan B' = \tan B \cdot \sec \epsilon_0,$$

$e = \sin \epsilon_0$ being the eccentricity of the spheroid or $\cos \epsilon_0$ the proportion of its polar to its equatorial diameter. The results of the measurements for the determination of the ellipticity of the ball of *Saturn*, while the ring appeared as a thin line, having not yet become known, I have again assumed $\cos \epsilon_0$ to be 0.900.

In the tables for the five satellites a and b denote the semi-axes of the apparent orbits, $l - L$ the orbital longitudes reckoned from the points which are in superior conjunction with the planet's centre or in opposition to the Earth in longitude. By adding to $l - L$ the value of L from the preceding table, the longitudes l are found, which are already corrected for the equation of light.

						<i>Mimas.</i>			
Greenwich Noon.	Semidiameter of Ball.	Semidiameter of Ball.	Semidiameter of Ball.	Semidiameter of Ball.	Semidiameter of Ball.	a_1	b_1	$l_1 - L$	Diff.
Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.	Equat. Phase. Polar.
Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.	Major Minor.
1894.									
Feb. 20	8''99	0''027	8''14	20''71	5''00	28'31	+6'83	302°47	1910°32
25	9'05	'024	8'20	20'86	5'00	28'51	6'83	52'79	'34
Mar. 2	9'11	'020	8'25	21'00	5'00	28'70	6'83	163'13	'36
7	9'16	'017	8'30	21'13	4'99	28'87	6'82	273'49	'38
12	9'21	'013	8'34	21'24	4'97	29'02	6'79	23'87	'40
17	9'26	'010	8'38	21'34	4'95	29'16	6'76	134'27	'40
22	9'29	'007	8'41	21'42	4'91	29'27	6'71	244'67	'40
27	9'32	'004	8'44	21'49	4'87	29'36	6'66	355'07	'41
Apr. 1	9'34	'001	8'46	21'53	4'83	29'43	6'60	105'48	'40
6	9'35	'000	8'47	21'56	4'78	29'47	6'53	215'88	'39
11	9'36	...	8'47	21'57	4'73	29'48	6'46	326'27	1910°37
16	9'35	'000	8'47	21'56	4'67	29'47	6'38	76'64	'35
21	9'34	'001	8'46	21'54	4'61	29'43	6'29	186'99	'33
26	9'32	'003	8'44	21'49	4'54	29'37	6'21	297'32	'30
May 1	9'30	'005	8'41	21'43	4'48	29'28	+6'12	47'62	'26
6	9'26	'008	8'38	21'35	4'42	29'17	6'03	157'88	'23
11	9'22	'011	8'34	21'25	4'35	29'04	5'95	268'11	'19
16	9'17	'015	8'29	21'14	4'29	28'89	5'87	18'30	'15
21	9'12	'018	8'24	21'02	4'24	28'72	5'79	128'45	'11
26	9'06	'022	8'19	20'88	4'18	28'54	5'71	238'56	'06
31	9'00	'025	8'14	20'74	4'13	28'34	5'64	348'62	1910°02
June 5	8'93	'029	8'08	20'59	4'09	28'13	5'58	98'64	1909°97
10	8'86	'032	8'01	20'43	4'05	27'92	5'53	208'61	'93
15	8'79	'034	7'95	20'27	4'01	27'69	5'48	318'54	'88
20	8'72	'037	7'88	20'10	3'98	27'46	5'44	68'42	'84
25	8'65	'039	7'82	19'93	3'95	27'23	5'40	178'26	'80
30	8'57	'040	7'75	19'76	3'93	27'00	5'38	288'06	'76
July 5	8'50	'041	7'69	19'59	3'92	26'77	5'36	37'82	1909°72
10	8'42	0'041	7'62	19'42	3'91	26'54	+5'35	147'54	

<i>Enceladus.</i>					<i>Tethys.</i>				
	a_2	b_2	$l_2 - L$	Diff.	a_2	b_2	$l_2 - L$	Diff.	
1894									
Feb. 20	36°31	+8°76	45°47	°	44°95	+10°84	292°35	°	953°71
25	36°57	8°77	279°38	1313°91	45°27	10°85	166°06	°94	°75
Mar. 2	36°81	8°76	153°32	°97	45°57	10°85	39°81	°77	°77
7	37°03	8°74	27°29	1313°99	45°84	10°83	273°58	°80	°80
12	37°24	8°71	261°28	1314°00	46°09	10°79	147°38	°82	°82
17	37°41	8°67	135°28	°02	46°30	10°73	21°20	°83	°83
22	37°55	8°61	9°30	°03	46°48	10°66	255°03	°85	°85
27	37°66	8°55	243°33	°03	46°62	10°58	128°88	°85	°85
Apr. 1	37°75	8°47	117°36	°03	46°73	10°48	2°73	°85	°85
6	37°80	8°38	351°39	°03	46°79	10°37	236°58	°85	°85
11	37°82	8°28	225°42	°01	46°81	10°25	110°43	°85	°85
16	37°80	8°18	99°43	1314°00	46°80	10°12	344°28	°83	°83
21	37°75	8°07	333°43	1313°98	46°74	9°99	218°11	°81	°81
26	37°67	7°96	207°41	°96	46°64	9°86	91°92	°80	953°80
May 1	37°56	+7°85	81°37	°93	46°50	+9°72	325°72	°77	°77
6	37°42	7°74	315°30	°89	46°33	9°58	199°49	°74	°74
11	37°25	7°63	189°19	°86	46°12	9°45	73°23	°71	°71
16	37°06	7°53	63°05	°83	45°88	9°32	306°94	°67	°67
21	36°85	7°43	296°88	°79	45°61	9°19	180°61	°63	°63
26	36°61	7°33	170°67	°74	45°32	9°07	54°24	°60	°60
31	36°36	7°24	44°41	°70	45°01	8°97	287°84	°56	°56
June 5	36°09	7°16	278°11	°67	44°68	8°87	161°40	°52	°52
10	35°81	7°09	151°78	°62	44°33	8°78	34°92	°48	°48
15	35°52	7°03	25°40	°57	43°98	8°70	268°40	°44	°44
20	35°23	6°98	258°97	°54	43°61	8°63	141°84	°40	°40
25	34°93	6°93	132°51	°49	43°24	8°58	15°24	°35	°35
30	34°64	6°90	6°00	°46	42°88	8°54	248°59	°31	°31
July 5	34°34	6°87	239°46	1313°41	42°51	8°51	121°90	°28	953°28
10	34°04	+6°86	112°87		42°14	+8°49	335°18		

<i>Dione.</i>					<i>Rhea.</i>			
1894.	a_4	b_4	$l_4 - L_4$	Diff.	a_8	b_8	$l_8 - L_8$	Diff.
Feb. 20	57 ⁵⁷	+ 13 ⁸⁸	17 ³¹	657 ⁸⁶	80 ⁴⁰	+ 19 ³⁹	357 ⁸³	398 ⁶³
25	57 ⁹⁸	13 ⁹⁰	315 ⁹⁰	.91	80 ⁹⁷	19 ⁴¹	36 ⁴⁶	.67
Mar. 2	58 ³⁶	13 ⁸⁹	253 ¹⁰	.94	81 ⁵¹	19 ⁴⁰	75 ¹³	.71
7	58 ⁷¹	13 ⁸⁶	191 ⁰⁴	.97	82 ⁰⁰	19 ³⁶	113 ⁸⁴	.73
12	59 ⁰³	13 ⁸¹	129 ⁰¹	657 ⁹⁹	82 ⁴⁴	19 ²⁹	152 ⁵⁷	.76
17	59 ³⁰	13 ⁷⁴	67 ⁰⁰	658 ⁰¹	82 ⁸²	19 ¹⁹	191 ³³	.77
22	59 ⁵³	13 ⁶⁶	5 ⁰¹	.02	83 ¹⁴	19 ⁰⁷	230 ¹⁰	.79
27	59 ⁷¹	13 ⁵⁵	303 ⁰³	.03	83 ³⁹	18 ⁹²	268 ⁸⁹	.80
Apr. 1	59 ⁸⁵	13 ⁴²	241 ⁰⁶	.04	83 ⁵⁸	18 ⁷⁵	307 ⁶⁹	.81
6	59 ⁹³	13 ²⁸	179 ¹⁰	.04	83 ⁶⁹	18 ⁵⁵	346 ⁵⁰	.81
11	59 ⁹⁶	13 ¹³	117 ¹⁴	.03	83 ⁷³	18 ³⁴	25 ³¹	.81
16	59 ⁹⁴	12 ⁹⁷	55 ¹⁷	.03	83 ⁷⁰	18 ¹¹	64 ¹²	.80
21	59 ⁸⁶	12 ⁸⁰	353 ²⁰	658 ⁰¹	83 ⁵⁹	17 ⁸⁷	102 ⁹²	.79
26	59 ⁷³	12 ⁶³	291 ²¹	657 ⁹⁹	83 ⁴¹	17 ⁶³	141 ⁷¹	.78
May 1	59 ⁵⁶	+ 12 ⁴⁵	229 ²⁰	.96	83 ¹⁷	+ 17 ³⁸	180 ⁴⁹	398 ⁷⁵
6	59 ³³	12 ²⁷	167 ¹⁶	.94	82 ⁸⁶	17 ¹⁴	219 ²⁴	.73
11	59 ⁰⁷	12 ¹⁰	105 ¹⁰	.92	82 ⁴⁹	16 ⁹⁰	257 ⁹⁷	.70
16	58 ⁷⁶	11 ⁹³	43 ⁰²	.88	82 ⁰⁶	16 ⁶⁶	296 ⁶⁷	.67
21	58 ⁴²	11 ⁷⁷	340 ⁹⁰	.84	81 ⁵⁸	16 ⁴⁴	335 ³⁴	.64
26	58 ⁰⁴	11 ⁶²	278 ⁷⁴	.81	81 ⁰⁶	16 ²³	13 ⁹⁸	.60
31	57 ⁶⁴	11 ⁴⁸	216 ⁵⁵	657 ⁷⁷	80 ⁵⁰	16 ⁰⁴	52 ⁵⁸	.56
June 5	57 ²²	11 ³⁶	154 ³²	.73	79 ⁹¹	15 ⁸⁶	91 ¹⁴	.53
10	56 ⁷⁸	11 ²⁴	92 ⁰⁵	.69	79 ²⁹	15 ⁷⁰	129 ⁶⁷	.49
15	56 ³²	11 ¹⁴	29 ⁷⁴	.65	78 ⁶⁵	15 ⁵⁶	168 ¹⁶	.45
20	55 ⁸⁶	11 ⁰⁶	327 ³⁹	.61	78 ⁰⁰	15 ⁴⁴	206 ⁶¹	.41
25	55 ³⁹	10 ⁹⁹	265 ⁰⁰	.57	77 ³⁵	15 ³⁵	245 ⁰²	.37
30	54 ⁹¹	10 ⁹⁴	202 ⁵⁷	.53	76 ⁶⁹	15 ²⁷	283 ³⁹	.33
July 5	54 ⁴⁴	10 ⁹⁰	140 ¹⁰	657 ⁴⁹	76 ⁰³	15 ²²	321 ⁷²	398 ³⁰
10	53 ⁹⁷	+ 10 ⁸⁷	77 ⁵⁹		75 ³⁷	+ 15 ¹⁹	0 ⁰²	

These values are to be interpolated for the times for which the apparent places of the satellites are required when the position-angles p and distances s , or the rectangular coordinates x and y referred to the axes of the disc of *Saturn*, are found by means of the formulæ:

$$s \sin (p - P) = x = a \sin (l - L)$$

$$s \cos (p - P) = y = b \cos (l - L).$$

The adopted zero-meridian will pass the centre of the disc of *Saturn* at the following Greenwich mean times :

1894.	h	m	h	m	1894.	h	m	h	m
Feb. 20	6	53.2	17	6.8	Mar. 29	8	33.6	18	47.2
21	13	33.9	23	47.3	30	5	0.7	15	14.3
22	10	1.1	20	14.6	31	11	41.5	21	55.0
23	6	28.2	16	41.8	Apr. 1	8	8.6	18	22.2
24	13	8.9	23	22.5	2	4	35.8	14	49.3
25	9	36.1	19	49.6	3	11	16.5	21	30.1
26	6	3.2	16	16.8	4	7	43.6	17	57.2
27	12	43.9	22	57.5	5	4	10.8	14	24.4
28	9	11.0	19	24.6	6	10	51.5	21	5.1
Mar. 1	5	38.2	15	51.7	7	7	18.7	17	32.3
2	12	18.9	22	32.4	8	3	45.9	13	59.4
3	8	46.0	18	59.6	9	10	26.6	20	40.2
4	5	13.1	15	26.7	10	6	53.8	17	7.3
5	11	53.8	22	7.4	11	3	20.9	13	34.5
6	8	20.9	18	34.5	12	10	1.7	20	15.3
7	4	48.1	15	1.6	13	6	28.8	16	42.4
8	11	28.7	21	42.3	14	2	56.0	13	9.6
9	7	55.9	18	9.4	15	9	36.8	19	50.4
10	4	23.0	14	36.6	16	6	4.0	16	17.6
11	11	3.7	21	17.3	17	2	31.1	12	44.7
12	7	30.8	17	44.4	18	9	11.9	19	25.5
13	3	58.0	14	11.5	19	5	39.1	15	52.7
14	10	38.7	20	52.2	20	2	6.3	12	19.9
15	7	5.8	17	19.4	21	8	47.1	19	0.7
16	3	32.9	13	46.5	22	5	14.3	15	27.9
17	10	13.6	20	27.2	23	1	41.5	11	55.1
18	6	40.8	16	54.3	24	8	22.3	18	35.9
19	3	7.9	13	21.5	25	4	49.5	15	3.1
20	9	48.6	20	2.2	26	1	16.7	11	30.3
21	6	15.8	16	29.3	27	7	57.5	18	11.1
22	2	42.9	12	56.5	28	4	24.7	14	38.3
23	9	23.6	19	37.2	29	11	5.5	21	19.1
24	5	50.7	16	4.3	30	7	32.7	17	46.3
25	2	17.9	12	31.5	May 1	3	59.9	14	13.5
26	8	58.6	19	12.2	2	10	40.8	20	54.4
27	5	25.7	15	39.3	3	7	8.0	17	21.6
28	12	6.4	22	20.0	4	3	35.2	13	48.8

1894.	h	m	h	m	1894.	h	m	h	m
May 5	10	16.1	20	29.7	June 7	5	46.6	16	0.3
6	6	43.3	16	56.9	8	2	13.9	12	27.6
7	3	10.5	13	24.2	9	8	55.0	19	8.6
8	9	51.4	20	5.0	10	5	22.3	15	36.0
9	6	18.6	16	32.3	11	1	49.7	12	3.3
10	2	45.9	12	59.5	12	8	30.7	18	44.4
11	9	26.8	19	40.4	13	4	58.1	15	11.7
12	5	54.0	16	7.6	14	1	25.4	11	39.1
13	2	21.3	12	34.9	15	8	6.5	18	20.1
14	9	2.2	19	15.8	16	4	33.8	14	47.5
15	5	29.4	15	43.1	17	1	1.2	11	14.9
16	1	56.7	12	10.3	18	7	42.2	17	55.9
17	8	37.6	18	51.2	19	4	9.6	14	23.3
18	5	4.9	15	18.5	20	0	37.0	10	50.7
19	1	32.1	11	45.8	21	7	18.1	17	31.8
20	8	13.1	18	26.7	22	3	45.5	13	59.1
21	4	40.3	14	54.0	23	0	12.8	10	26.5
22	1	7.6	11	21.3	24	6	53.9	17	7.6
23	7	48.6	18	2.2	25	3	21.3	13	35.0
24	4	15.9	14	29.5	26	10	2.4	20	16.1
25	10	56.8	21	10.5	27	6	29.8	16	43.5
26	7	24.1	17	37.8	28	2	57.2	13	10.9
27	3	51.4	14	5.1	29	9	38.3	19	52.0
28	10	32.4	20	46.0	30	6	5.7	16	19.4
29	6	59.7	17	13.3	July 1	2	33.1	12	46.8
30	3	27.0	13	40.6	2	9	14.2	19	28.0
31	10	8.0	20	21.6	3	5	41.7	15	55.4
June 1	6	35.3	16	48.9	4	2	9.1	12	22.8
2	3	2.6	13	16.3	5	8	50.2	19	3.9
3	9	43.6	19	57.3	6	5	17.6	15	31.3
4	6	10.9	16	24.6	7	1	45.0	11	58.8
5	2	38.3	12	51.9	8	8	26.2	18	39.9
6	9	19.3	19	32.9	9	4	53.6	15	7.3

Approximate Greenwich times of the conjunctions of the satellites with the centre of the planet, or of their crossing the direction of the polar-axis of the ball.

"n" satellite north, in superior conjunction, moving from the preceding to the following side.

"s" satellite south, in inferior conjunction, moving from the following to the preceding side.

In the case of *Rhea* the times of the greatest elongations, "e" east, "w" west, are also given.

G.M.T.		G.M.T.		G.M.T.	
1894.	h	1894.	h	1894.	h
Feb. 20	8.5 Te. <i>n</i>	Mar. 1	13.7 Mi. <i>n</i>	Mar. 11	0.1 En. <i>n</i>
	12.3 En. <i>s</i>		19.0 Te. <i>n</i>		0.5 Di. <i>n</i>
	14.9 Mi. <i>s</i>	2	1.1 Mi. <i>s</i>		5.2 Rh. <i>e</i>
21	2.2 Mi. <i>n</i>		2.4 En. <i>s</i>		5.5 Te. <i>n</i>
	3.7 Rh. <i>e</i>		4.5 Rh. <i>e</i>		11.2 Mi. <i>s</i>
	4.7 En. <i>n</i>		12.4 Mi. <i>n</i>		16.6 En. <i>s</i>
	5.7 Di. <i>s</i>		17.6 Te. <i>s</i>		22.5 Mi. <i>n</i>
	7.2 Te. <i>s</i>		18.9 En. <i>n</i>	12	4.1 Te. <i>s</i>
	13.5 Mi. <i>s</i>		19.5 Di. <i>n</i>		8.2 Rh. <i>s</i>
	21.2 En. <i>s</i>		23.7 Mi. <i>s</i>		9.0 En. <i>n</i>
22	0.8 Mi. <i>n</i>	3	7.6 Rh. <i>s</i>		9.3 Di. <i>s</i>
	5.8 Te. <i>n</i>		11.0 Mi. <i>n</i>		9.8 Mi. <i>s</i>
	6.8 Rh. <i>s</i>		11.3 En. <i>s</i>		21.1 Mi. <i>n</i>
	12.1 Mi. <i>s</i>		16.3 Te. <i>n</i>	13	1.4 En. <i>s</i>
	13.6 En. <i>n</i>		22.3 Mi. <i>s</i>		2.7 Te. <i>n</i>
	14.5 Di. <i>n</i>	4	3.7 En. <i>n</i>		8.4 Mi. <i>s</i>
	23.5 Mi. <i>n</i>		4.3 Di. <i>s</i>		11.3 Rh. <i>w</i>
23	4.5 Te. <i>s</i>		9.6 Mi. <i>n</i>		17.9 En. <i>n</i>
	6.0 En. <i>s</i>		10.6 Rh. <i>w</i>		18.1 Di. <i>n</i>
	9.9 Rh. <i>w</i>		14.9 Te. <i>s</i>		19.7 Mi. <i>n</i>
	10.8 Mi. <i>s</i>		20.2 En. <i>s</i>	14	1.4 Te. <i>s</i>
	22.1 Mi. <i>n</i>		20.9 Mi. <i>s</i>		7.0 Mi. <i>s</i>
	22.5 En. <i>n</i>	5	8.2 Mi. <i>n</i>		10.3 En. <i>s</i>
	23.3 Di. <i>s</i>		12.6 En. <i>n</i>		14.4 Rh. <i>n</i>
24	3.1 Te. <i>n</i>		13.2 Di. <i>n</i>		18.3 Mi. <i>n</i>
	9.4 Mi. <i>s</i>		13.6 Te. <i>n</i>	15	0.0 Te. <i>n</i>
	13.0 Rh. <i>n</i>		13.7 Rh. <i>n</i>		2.8 En. <i>n</i>
	14.9 En. <i>s</i>		19.5 Mi. <i>s</i>		2.9 Di. <i>s</i>
	20.7 Mi. <i>n</i>	6	5.1 En. <i>s</i>		5.6 Mi. <i>s</i>
25	1.7 Te. <i>s</i>		6.8 Mi. <i>n</i>		16.9 Mi. <i>n</i>
	7.4 En. <i>n</i>		12.2 Te. <i>s</i>		17.5 Rh. <i>e</i>
	8.0 Mi. <i>s</i>		16.8 Rh. <i>e</i>		19.2 En. <i>s</i>
	8.2 Di. <i>n</i>		18.1 Mi. <i>s</i>		22.7 Te. <i>s</i>
	16.1 Rh. <i>e</i>		21.5 En. <i>n</i>	16	4.3 Mi. <i>s</i>
	19.3 Mi. <i>n</i>		22.0 Di. <i>s</i>		11.6 En. <i>n</i>
	23.8 En. <i>s</i>	7	5.4 Mi. <i>n</i>		11.8 Di. <i>n</i>
26	0.4 Te. <i>n</i>		10.9 Te. <i>n</i>		15.6 Mi. <i>n</i>
	6.6 Mi. <i>s</i>		13.9 En. <i>s</i>		20.6 Rh. <i>s</i>
	16.2 En. <i>n</i>		16.7 Mi. <i>s</i>		21.3 Te. <i>n</i>
	17.0 Di. <i>s</i>		19.9 Rh. <i>s</i>	17	2.9 Mi. <i>s</i>
	17.9 Mi. <i>n</i>	8	4.0 Mi. <i>n</i>		4.1 En. <i>s</i>
	19.2 Rh. <i>s</i>		6.4 En. <i>n</i>		14.2 Mi. <i>n</i>
	23.0 Te. <i>s</i>		6.8 Di. <i>n</i>		20.0 Te. <i>s</i>
27	5.2 Mi. <i>s</i>		9.5 Te. <i>s</i>		20.5 En. <i>n</i>
	8.7 En. <i>s</i>		15.3 Mi. <i>s</i>		20.6 Di. <i>s</i>
	16.5 Mi. <i>n</i>		22.8 En. <i>s</i>		23.7 Rh. <i>w</i>
	21.7 Te. <i>n</i>		23.0 Rh. <i>w</i>	18	1.5 Mi. <i>s</i>
	22.3 Rh. <i>w</i>	9	2.7 Mi. <i>n</i>		12.8 Mi. <i>n</i>
28	1.1 En. <i>n</i>		8.2 Te. <i>n</i>		13.0 En. <i>s</i>
	1.8 Di. <i>n</i>		14.0 Mi. <i>s</i>		18.6 Te. <i>n</i>
	3.8 Mi. <i>s</i>		15.3 En. <i>n</i>	19	0.1 Mi. <i>s</i>
	15.1 Mi. <i>n</i>		15.6 Di. <i>s</i>		2.8 Rh. <i>n</i>
	17.6 En. <i>s</i>	10	1.3 Mi. <i>n</i>		5.4 En. <i>n</i>
	20.3 Te. <i>s</i>		2.1 Rh. <i>n</i>		5.4 Di. <i>n</i>
Mar. 1	1.4 Rh. <i>n</i>		6.8 Te. <i>s</i>		11.4 Mi. <i>n</i>
	2.4 Mi. <i>s</i>		7.7 En. <i>s</i>		17.3 Te. <i>s</i>
	10.0 En. <i>n</i>		12.6 Mi. <i>s</i>		21.8 En. <i>s</i>
	10.7 Di. <i>s</i>		23.9 Mi. <i>n</i>		22.7 Mi. <i>s</i>

G.M.T.		G.M.T.		G.M.T.	
1894.	h	1894.	h	1894.	h
Mar. 20	5.8 Rh. <i>e</i>	Mar. 28	19.5 En. <i>n</i>	Apr. 6	15.5 Te. <i>n</i>
	10.0 Mi. <i>n</i>		21.5 Mi. <i>n</i>		17.2 En. <i>s</i>
	14.3 En. <i>n</i>	29	3.7 Te. <i>s</i>		20.4 Mi. <i>s</i>
	15.9 Te. <i>n</i>		6.5 Rh. <i>e</i>	7	7.1 Rh. <i>e</i>
	Transit of Venus*		8.8 Mi. <i>s</i>		7.7 Mi. <i>n</i>
	21.3 Mi. <i>s</i>		12.0 En. <i>s</i>		9.0 Di. <i>n</i>
	Transit of Mercury*		20.1 Mi. <i>n</i>		9.7 En. <i>n</i>
21	6.7 En. <i>s</i>	30	2.4 Te. <i>n</i>		14.2 Te. <i>s</i>
	8.6 Mi. <i>n</i>		4.0 Di. <i>n</i>		19.0 Mi. <i>s</i>
	8.9 Rh. <i>s</i>		4.4 En. <i>n</i>	8	2.1 En. <i>s</i>
	14.6 Te. <i>s</i>		7.5 Mi. <i>s</i>		6.3 Mi. <i>n</i>
	19.9 Mi. <i>s</i>		9.6 Rh. <i>s</i>		10.2 Rh. <i>s</i>
	23.1 Di. <i>n</i>		18.8 Mi. <i>n</i>		12.8 Te. <i>n</i>
	23.1 En. <i>n</i>		20.8 En. <i>s</i>		17.6 Mi. <i>s</i>
22	7.2 Mi. <i>n</i>	31	1.0 Te. <i>s</i>		17.8 Di. <i>s</i>
	12.0 Rh. <i>w</i>		6.1 Mi. <i>s</i>		18.5 En. <i>n</i>
	13.2 Te. <i>n</i>		12.7 Rh. <i>w</i>	9	4.9 Mi. <i>n</i>
	15.6 En. <i>s</i>		12.9 Di. <i>s</i>		11.0 En. <i>s</i>
	18.5 Mi. <i>s</i>		13.3 En. <i>n</i>		11.5 Te. <i>s</i>
23	5.9 Mi. <i>n</i>		17.4 Mi. <i>n</i>		13.3 Rh. <i>w</i>
	7.9 Di. <i>s</i>		23.7 Te. <i>n</i>		16.2 Mi. <i>s</i>
	8.0 En. <i>n</i>	Apr. 1	4.7 Mi. <i>s</i>	10	2.6 Di. <i>n</i>
	11.8 Te. <i>s</i>		5.7 En. <i>s</i>		3.4 En. <i>n</i>
	15.1 Rh. <i>n</i>		15.7 Rh. <i>n</i>		3.5 Mi. <i>n</i>
	17.2 Mi. <i>s</i>		16.0 Mi. <i>n</i>		10.1 Te. <i>n</i>
24	0.5 En. <i>s</i>		21.7 Di. <i>n</i>		14.8 Mi. <i>s</i>
	4.5 Mi. <i>n</i>		22.2 En. <i>n</i>		16.4 Rh. <i>n</i>
	10.5 Te. <i>n</i>		22.3 Te. <i>s</i>		19.8 En. <i>s</i>
	15.8 Mi. <i>s</i>	2	3.3 Mi. <i>s</i>	11	1.4 δ of * 6.6 ^m †
	16.7 Di. <i>n</i>		14.6 En. <i>s</i>		with prec. end of
	16.9 En. <i>n</i>		14.6 Mi. <i>n</i>		ring 49.8" <i>n</i>
	18.2 Rh. <i>e</i>		18.8 Rh. <i>e</i>		2.1 Mi. <i>n</i>
25	3.1 Mi. <i>n</i>		20.9 Te. <i>n</i>		3.4 δ of * w.
	9.1 Te. <i>s</i>	3	1.9 Mi. <i>s</i>		centre 40.3" <i>n</i>
	9.3 En. <i>s</i>		6.5 Di. <i>s</i>		5.5 δ of * w.
	14.4 Mi. <i>s</i>		7.0 En. <i>n</i>		fol. end of
	21.2 Rh. <i>s</i>		13.2 Mi. <i>n</i>		ring 30.3" <i>n</i>
26	1.6 Di. <i>s</i>		19.6 Te. <i>s</i>		8.7 Te. <i>s</i>
	1.7 Mi. <i>n</i>		21.9 Rh. <i>s</i>		10.2 close δ of
	1.8 En. <i>n</i>		23.5 En. <i>s</i>		* with Rh.
	7.8 Te. <i>n</i>	4	0.5 Mi. <i>s</i>		11.5 Di. <i>s</i>
	13.0 Mi. <i>s</i>		11.8 Mi. <i>n</i>		12.3 En. <i>n</i>
	18.2 En. <i>s</i>		15.3 Di. <i>n</i>		13.4 Mi. <i>s</i>
27	0.3 Mi. <i>n</i>		15.9 En. <i>n</i>		19.5 Rh. <i>e</i>
	0.3 Rh. <i>w</i>		18.2 Te. <i>n</i>	12	0.7 Mi. <i>n</i>
	6.4 Te. <i>s</i>		23.1 Mi. <i>s</i>		4.7 En. <i>s</i>
	10.4 Di. <i>n</i>	5	1.0 Rh. <i>w</i>		7.4 Te. <i>n</i>
	10.7 En. <i>n</i>		8.3 En. <i>s</i>		12.0 Mi. <i>s</i>
	11.6 Mi. <i>s</i>		10.4 Mi. <i>n</i>		20.3 Di. <i>n</i>
	22.9 Mi. <i>n</i>		16.9 Te. <i>s</i>		21.2 En. <i>n</i>
28	3.1 En. <i>s</i>		21.7 Mi. <i>s</i>		22.5 Rh. <i>s</i>
	3.4 Rh. <i>n</i>	6	0.2 Di. <i>s</i>		23.3 Mi. <i>n</i>
	5.1 Te. <i>n</i>		0.8 En. <i>n</i>	13	6.0 Te. <i>s</i>
	10.2 Mi. <i>s</i>		4.1 Rh. <i>n</i>		10.6 Mi. <i>s</i>
	19.2 Di. <i>s</i>		9.0 Mi. <i>n</i>		13.6 En. <i>s</i>

* *V.* Note on the Transit.† The star 6.6^m is Arg. G. C. 18379, and its apparent place—
13^h 24^m 55.76^s—5° 55' 39.5".

G.M.T.	
1894.	h
Apr. 13	22.0 Mi. <i>n</i>
14	1.6 Rh. <i>w</i>
	4.7 Te. <i>n</i>
	5.1 Di. <i>s</i>
	6.0 En. <i>n</i>
	9.3 Mi. <i>s</i>
	20.6 Mi. <i>n</i>
	22.5 En. <i>s</i>
15	3.3 Te. <i>s</i>
	4.7 Rh. <i>n</i>
	7.9 Mi. <i>s</i>
	13.9 Di. <i>n</i>
	14.9 En. <i>n</i>
	19.2 Mi. <i>n</i>
16	2.0 Te. <i>n</i>
	6.5 Mi. <i>s</i>
	7.4 En. <i>s</i>
	7.8 Rh. <i>e</i>
	17.8 Mi. <i>n</i>
	22.8 Di. <i>s</i>
	23.8 En. <i>n</i>
17	0.6 Te. <i>s</i>
	5.1 Mi. <i>s</i>
	10.9 Rh. <i>s</i>
	16.2 En. <i>s</i>
	16.4 Mi. <i>n</i>
	23.3 Te. <i>n</i>
18	3.7 Mi. <i>s</i>
	7.6 Di. <i>n</i>
	8.7 En. <i>n</i>
	13.9 Rh. <i>w</i>
	15.0 Mi. <i>n</i>
	21.9 Te. <i>s</i>
19	1.1 En. <i>s</i>
	2.3 Mi. <i>s</i>
	13.6 Mi. <i>n</i>
	16.4 Di. <i>s</i>
	17.0 Rh. <i>n</i>
	17.5 En. <i>n</i>
	20.6 Te. <i>n</i>
20	0.9 Mi. <i>s</i>
	10.0 En. <i>s</i>
	12.2 Mi. <i>n</i>
	19.2 Te. <i>s</i>
	20.1 Rh. <i>e</i>
	23.6 Mi. <i>s</i>
21	1.2 Di. <i>n</i>
	2.4 En. <i>n</i>
	10.9 Mi. <i>n</i>
	17.8 Te. <i>n</i>
	18.9 En. <i>s</i>
	22.2 Mi. <i>s</i>
	23.2 Rh. <i>s</i>
22	9.5 Mi. <i>n</i>
	10.1 Di. <i>s</i>
	11.3 En. <i>n</i>
	16.5 Te. <i>s</i>
	20.8 Mi. <i>s</i>

G.M.T.	
1894.	h
Apr. 23	2.3 Rh. <i>w</i>
	3.7 En. <i>s</i>
	8.1 Mi. <i>n</i>
	15.1 Te. <i>n</i>
	18.9 Di. <i>n</i>
	19.4 Mi. <i>s</i>
	20.2 En. <i>n</i>
24	5.3 Rh. <i>n</i>
	6.7 Mi. <i>n</i>
	12.6 En. <i>s</i>
	13.8 Te. <i>s</i>
	18.0 Mi. <i>s</i>
25	3.7 Di. <i>s</i>
	5.1 En. <i>n</i>
	5.3 Mi. <i>n</i>
	8.4 Rh. <i>e</i>
	12.4 Te. <i>n</i>
	16.6 Mi. <i>s</i>
	21.5 En. <i>s</i>
26	3.9 Mi. <i>n</i>
	11.1 Te. <i>s</i>
	11.5 Rh. <i>s</i>
	12.5 Di. <i>n</i>
	13.9 En. <i>n</i>
	15.2 Mi. <i>s</i>
27	2.5 Mi. <i>n</i>
	6.4 En. <i>s</i>
	9.7 Te. <i>n</i>
	13.9 Mi. <i>s</i>
	14.6 Rh. <i>w</i>
	21.4 Di. <i>s</i>
	22.8 En. <i>n</i>
28	1.2 Mi. <i>n</i>
	8.4 Te. <i>s</i>
	12.5 Mi. <i>s</i>
	15.2 En. <i>s</i>
	17.7 Rh. <i>n</i>
	23.8 Mi. <i>n</i>
29	6.2 Di. <i>n</i>
	7.0 Te. <i>n</i>
	7.7 En. <i>n</i>
	11.1 Mi. <i>s</i>
	20.8 Rh. <i>e</i>
	22.4 Mi. <i>n</i>
30	0.1 En. <i>s</i>
	5.7 Te. <i>s</i>
	9.7 Mi. <i>s</i>
	15.0 Di. <i>s</i>
	16.6 En. <i>n</i>
	21.0 Mi. <i>n</i>
	23.8 Rh. <i>s</i>
May 1	4.3 Te. <i>n</i>
	8.3 Mi. <i>s</i>
	9.0 En. <i>s</i>
	19.6 Mi. <i>n</i>
	23.9 Di. <i>n</i>
2	1.4 En. <i>n</i>
	2.9 Rh. <i>w</i>

G.M.T.	
1894.	h
May 2	3.0 Te. <i>s</i>
	6.9 Mi. <i>s</i>
	17.9 En. <i>s</i>
	18.2 Mi. <i>n</i>
3	1.6 Te. <i>n</i>
	5.5 Mi. <i>s</i>
	6.0 Rh. <i>n</i>
	8.7 Di. <i>s</i>
	10.3 En. <i>n</i>
	16.8 Mi. <i>n</i>
4	0.2 Te. <i>s</i>
	2.8 En. <i>s</i>
	4.2 Mi. <i>s</i>
	9.1 Rh. <i>e</i>
	15.5 Mi. <i>n</i>
	17.5 Di. <i>n</i>
	19.2 En. <i>n</i>
	22.9 Te. <i>n</i>
5	2.8 Mi. <i>s</i>
	11.6 En. <i>s</i>
	12.2 Rh. <i>s</i>
	14.1 Mi. <i>n</i>
	21.5 Te. <i>s</i>
6	1.4 Mi. <i>s</i>
	2.3 Di. <i>s</i>
	4.1 En. <i>s</i>
	12.7 Mi. <i>n</i>
	15.3 Rh. <i>w</i>
	20.2 Te. <i>n</i>
	20.5 En. <i>s</i>
7	0.0 Mi. <i>s</i>
	11.2 Di. <i>n</i>
	11.3 Mi. <i>n</i>
	13.0 En. <i>n</i>
	18.4 Rh. <i>n</i>
	18.8 Te. <i>s</i>
	22.6 Mi. <i>s</i>
8	5.4 En. <i>s</i>
	9.9 Mi. <i>n</i>
	17.5 Te. <i>n</i>
	20.0 Di. <i>s</i>
	21.2 Mi. <i>s</i>
	21.4 Rh. <i>e</i>
	21.8 En. <i>n</i>
9	8.5 Mi. <i>n</i>
	14.3 En. <i>s</i>
	16.1 Te. <i>s</i>
	19.8 Mi. <i>s</i>
10	0.5 Rh. <i>s</i>
	4.8 Di. <i>n</i>
	6.7 En. <i>n</i>
	7.2 Mi. <i>n</i>
	14.8 Te. <i>n</i>
	18.5 Mi. <i>s</i>
	23.2 En. <i>s</i>
11	3.6 Rh. <i>w</i>
	5.8 Mi. <i>n</i>
	13.4 Te. <i>s</i>

G.M.T.		G.M.T.		G.M.T.	
1894.	h	1894.	h	1894.	h
May 11	13 ⁷ Di. <i>s</i>	May 20	23 ⁹ Te. <i>s</i>	May 30	3 ⁵ En. <i>s</i>
	15 ⁶ En. <i>n</i>	21	3 ² Mi. <i>s</i>		8 ² Rh. <i>n</i>
	17 ¹ Mi. <i>s</i>		3 ⁵ Di. <i>n</i>		10 ⁴ Te. <i>s</i>
12	4 ⁴ Mi. <i>n</i>		5 ⁸ En. <i>n</i>		13 ⁴ Mi. <i>s</i>
	6 ⁷ Rh. <i>n</i>		7 ⁴ Rh. <i>n</i>		17 ³ Di. <i>s</i>
	8 ⁰ En. <i>s</i>		14 ⁵ Mi. <i>n</i>		19 ⁹ En. <i>n</i>
	12 ¹ Te. <i>n</i>		22 ² En. <i>s</i>	31	0 ⁷ Mi. <i>n</i>
	15 ⁷ Mi. <i>s</i>		22 ⁶ Te. <i>n</i>		9 ⁴ Te. <i>n</i>
	22 ⁵ Di. <i>n</i>	22	1 ⁹ Mi. <i>s</i>		11 ³ Rh. <i>e</i>
13	0 ⁵ En. <i>n</i>		10 ⁵ Rh. <i>e</i>		12 ⁰ Mi. <i>s</i>
	3 ⁰ Mi. <i>n</i>		12 ³ Di. <i>s</i>		12 ⁴ En. <i>s</i>
	9 ⁸ Rh. <i>e</i>		13 ² Mi. <i>n</i>		23 ³ Mi. <i>n</i>
	10 ⁷ Te. <i>s</i>		14 ⁶ En. <i>n</i>	June 1	2 ² Di. <i>n</i>
	14 ³ Mi. <i>s</i>		21 ² Te. <i>s</i>		4 ⁸ En. <i>n</i>
	16 ⁹ En. <i>s</i>	23	0 ⁵ Mi. <i>s</i>		7 ⁷ Te. <i>s</i>
14	1 ⁶ Mi. <i>n</i>		7 ¹ En. <i>s</i>		10 ⁶ Mi. <i>s</i>
	7 ³ Di. <i>s</i>		11 ⁸ Mi. <i>n</i>		14 ⁴ Rh. <i>s</i>
	9 ⁴ En. <i>n</i>		13 ⁶ Rh. <i>s</i>		21 ³ En. <i>s</i>
	9 ⁴ Te. <i>n</i>		19 ⁹ Te. <i>n</i>		21 ⁹ Mi. <i>n</i>
	12 ⁹ Rh. <i>s</i>		21 ¹ Di. <i>n</i>	2	6 ⁴ Te. <i>n</i>
	12 ⁹ Mi. <i>s</i>		23 ¹ Mi. <i>s</i>		9 ³ Mi. <i>s</i>
15	0 ² Mi. <i>n</i>		23 ⁵ En. <i>n</i>		11 ⁰ Di. <i>s</i>
	1 ⁸ En. <i>s</i>	24	10 ⁴ Mi. <i>n</i>		13 ⁷ En. <i>n</i>
	8 ⁰ Te. <i>s</i>		16 ⁰ En. <i>s</i>		17 ⁵ Rh. <i>w</i>
	11 ⁵ Mi. <i>s</i>		16 ⁷ Rh. <i>w</i>		20 ⁶ Mi. <i>n</i>
	16 ⁰ Rh. <i>w</i>		18 ⁵ Te. <i>s</i>	3	5 ⁰ Te. <i>s</i>
	16 ² Di. <i>n</i>		21 ⁷ Mi. <i>s</i>		6 ¹ En. <i>s</i>
	18 ² En. <i>n</i>	25	6 ⁰ Di. <i>s</i>		7 ⁹ Mi. <i>s</i>
	22 ⁸ Mi. <i>n</i>		8 ⁴ En. <i>n</i>		19 ² Mi. <i>n</i>
16	6 ⁷ Te. <i>n</i>		9 ⁰ Mi. <i>n</i>		19 ⁸ Di. <i>n</i>
	10 ² Mi. <i>s</i>		17 ² Te. <i>n</i>		20 ⁶ Rh. <i>n</i>
	10 ⁷ En. <i>s</i>		19 ⁸ Rh. <i>n</i>		22 ⁶ En. <i>n</i>
	19 ¹ Rh. <i>n</i>		20 ³ Mi. <i>s</i>	4	3 ⁷ Te. <i>n</i>
	21 ⁵ Mi. <i>n</i>	26	0 ⁸ En. <i>s</i>		6 ⁵ Mi. <i>s</i>
17	1 ⁰ Di. <i>s</i>		7 ⁶ Mi. <i>n</i>		15 ⁰ En. <i>s</i>
	3 ¹ En. <i>n</i>		14 ⁸ Di. <i>n</i>		17 ⁸ Mi. <i>n</i>
	5 ³ Te. <i>s</i>		15 ⁸ Te. <i>s</i>		23 ⁷ Rh. <i>e</i>
	8 ⁸ Mi. <i>s</i>		17 ³ En. <i>n</i>	5	2 ³ Te. <i>s</i>
	19 ⁶ En. <i>s</i>		18 ⁹ Mi. <i>s</i>		4 ⁷ Di. <i>n</i>
	20 ¹ Mi. <i>n</i>		22 ⁹ Rh. <i>e</i>		5 ¹ Mi. <i>s</i>
	22 ¹ Rh. <i>e</i>	27	6 ² Mi. <i>n</i>		7 ⁵ En. <i>n</i>
18	4 ⁰ Te. <i>n</i>		9 ⁷ En. <i>s</i>		16 ⁴ Mi. <i>n</i>
	7 ⁴ Mi. <i>s</i>		14 ⁵ Te. <i>n</i>		23 ⁹ En. <i>s</i>
	9 ⁸ Di. <i>n</i>		17 ⁶ Mi. <i>s</i>	6	1 ⁰ Te. <i>n</i>
	12 ⁰ En. <i>n</i>		23 ⁷ Di. <i>s</i>		2 ⁸ Rh. <i>s</i>
	18 ⁷ Mi. <i>n</i>	28	2 ⁰ Rh. <i>s</i>		3 ⁷ Mi. <i>s</i>
19	1 ² Rh. <i>s</i>		2 ² En. <i>n</i>		13 ⁵ Di. <i>n</i>
	2 ⁶ Te. <i>s</i>		4 ⁹ Mi. <i>n</i>		15 ⁰ Mi. <i>n</i>
	4 ⁴ En. <i>s</i>		13 ¹ Te. <i>s</i>		16 ⁴ En. <i>n</i>
	6 ⁰ Mi. <i>s</i>		16 ² Mi. <i>s</i>		23 ⁶ Te. <i>s</i>
	17 ¹ Mi. <i>n</i>		18 ⁶ En. <i>s</i>	7	2 ³ Mi. <i>s</i>
	18 ⁶ Di. <i>s</i>	29	3 ⁵ Mi. <i>n</i>		5 ⁹ Rh. <i>w</i>
	20 ⁹ En. <i>n</i>		5 ¹ Rh. <i>w</i>		8 ⁸ En. <i>s</i>
20	1 ³ Te. <i>n</i>		8 ⁵ Di. <i>n</i>		13 ⁷ Mi. <i>n</i>
	4 ³ Rh. <i>w</i>		11 ¹ En. <i>n</i>		22 ³ Te. <i>n</i>
	4 ⁶ Mi. <i>s</i>		11 ⁸ Te. <i>n</i>		22 ⁴ Di. <i>s</i>
	13 ³ En. <i>s</i>		14 ⁸ Mi. <i>s</i>	8	1 ⁰ Mi. <i>s</i>
	15 ⁹ Mi. <i>n</i>	30	2 ¹ Mi. <i>n</i>		1 ² En. <i>n</i>

G.M.T.		G.M.T.		G.M.T.	
1894.	h	1894.	h	1894.	h
June 8	9 ⁰ Rh. <i>n</i>	June 16	23 ⁰ En. <i>s</i>	June 25	0 ¹ Mi. <i>s</i>
	12 ³ Mi. <i>n</i>		23 ⁸ Mi. <i>n</i>		4 ³ En. <i>s</i>
	17 ⁷ En. <i>s</i>	17	8 ⁸ Te. <i>n</i>		7 ⁵ Rh. <i>w</i>
	20 ⁹ Te. <i>s</i>		9 ⁸ Rh. <i>n</i>		11 ⁴ Mi. <i>n</i>
	23 ⁶ Mi. <i>s</i>		11 ¹ Mi. <i>s</i>		17 ³ Di. <i>n</i>
9	7 ² Di. <i>n</i>		12 ³ Di. <i>n</i>		20 ⁷ Te. <i>s</i>
	10 ¹ En. <i>n</i>		15 ⁴ En. <i>n</i>		20 ⁸ En. <i>n</i>
	10 ⁹ Mi. <i>n</i>		22 ⁵ Mi. <i>n</i>		22 ⁷ Mi. <i>s</i>
	12 ¹ Rh. <i>e</i>	Transit of Mercury.		26	10 ⁰ Mi. <i>n</i>
	19 ⁶ Te. <i>n</i>	18	7 ⁵ Te. <i>s</i>		10 ⁶ Rh. <i>n</i>
	22 ² Mi. <i>s</i>		7 ⁹ En. <i>s</i>		13 ² En. <i>s</i>
10	2 ⁶ En. <i>s</i>		9 ⁸ Mi. <i>s</i>		19 ⁴ Te. <i>n</i>
	9 ⁵ Mi. <i>n</i>		12 ⁹ Rh. <i>e</i>		21 ³ Mi. <i>s</i>
	15 ² Rh. <i>s</i>		21 ¹ Mi. <i>n</i>	27	2 ² Di. <i>s</i>
	16 ⁰ Di. <i>s</i>		21 ¹ Di. <i>s</i>		5 ⁷ En. <i>n</i>
	18 ³ Te. <i>s</i>	19	0 ³ En. <i>n</i>		8 ⁷ Mi. <i>n</i>
	19 ⁰ En. <i>n</i>		6 ¹ Te. <i>n</i>		13 ⁷ Rh. <i>e</i>
	20 ⁸ Mi. <i>s</i>		8 ⁴ Mi. <i>s</i>		18 ⁰ Te. <i>s</i>
11	8 ¹ Mi. <i>n</i>		16 ⁰ Rh. <i>s</i>		20 ⁰ Mi. <i>s</i>
	11 ⁵ En. <i>s</i>		16 ⁸ En. <i>s</i>		22 ¹ En. <i>s</i>
	16 ⁹ Te. <i>n</i>		19 ⁷ Mi. <i>n</i>	28	7 ³ Mi. <i>n</i>
	18 ³ Rh. <i>w</i>	20	4 ⁸ Te. <i>s</i>		11 ⁰ Di. <i>n</i>
	19 ⁴ Mi. <i>s</i>		5 ⁹ Di. <i>n</i>		14 ⁶ En. <i>n</i>
12	0 ⁹ Di. <i>n</i>		7 ⁰ Mi. <i>s</i>		16 ⁷ Te. <i>n</i>
	3 ⁹ En. <i>n</i>		9 ² En. <i>n</i>		16 ⁹ Rh. <i>s</i>
	6 ⁷ Mi. <i>n</i>		18 ³ Mi. <i>n</i>		18 ⁶ Mi. <i>s</i>
	15 ⁶ Te. <i>s</i>		19 ¹ Rh. <i>w</i>	29	5 ⁹ Mi. <i>n</i>
	18 ¹ Mi. <i>s</i>	21	1 ⁷ En. <i>s</i>		7 ⁰ En. <i>s</i>
	20 ³ En. <i>s</i>		3 ⁵ Te. <i>n</i>		15 ⁴ Te. <i>s</i>
	21 ⁴ Rh. <i>n</i>		5 ⁶ Mi. <i>s</i>		17 ² Mi. <i>s</i>
13	5 ⁴ Mi. <i>n</i>		14 ⁸ Di. <i>s</i>		19 ⁹ Di. <i>s</i>
	9 ⁷ Di. <i>s</i>		16 ⁹ Mi. <i>n</i>		20 ⁰ Rh. <i>w</i>
	12 ⁸ En. <i>n</i>		18 ¹ En. <i>n</i>		23 ⁴ En. <i>n</i>
	14 ² Te. <i>n</i>		22 ² Rh. <i>n</i>	30	4 ⁵ Mi. <i>n</i>
	16 ⁷ Mi. <i>s</i>	22	2 ¹ Te. <i>s</i>		14 ⁰ Te. <i>n</i>
14	0 ⁵ Rh. <i>e</i>		4 ² Mi. <i>s</i>		15 ⁸ Mi. <i>s</i>
	4 ⁰ Mi. <i>n</i>		10 ⁶ En. <i>s</i>		15 ⁹ En. <i>s</i>
	5 ² En. <i>s</i>		15 ⁶ Mi. <i>n</i>		23 ¹ Rh. <i>n</i>
	12 ⁹ Te. <i>s</i>		23 ⁶ Di. <i>n</i>	July 1	4 ⁷ Di. <i>n</i>
	15 ³ Mi. <i>s</i>	23	0 ⁸ Te. <i>n</i>		8 ³ En. <i>n</i>
	18 ⁶ Di. <i>n</i>		1 ³ Rh. <i>e</i>		12 ⁷ Te. <i>s</i>
	21 ⁷ En. <i>n</i>		2 ⁹ Mi. <i>s</i>	2	2 ² Rh. <i>e</i>
15	2 ⁶ Mi. <i>n</i>		3 ⁰ En. <i>n</i>		11 ³ Te. <i>n</i>
	3 ⁶ Rh. <i>s</i>		14 ² Mi. <i>n</i>		13 ⁶ Di. <i>s</i>
	11 ⁵ Te. <i>n</i>		19 ⁴ En. <i>s</i>	3	5 ³ Rh. <i>s</i>
	13 ⁹ Mi. <i>s</i>		23 ⁴ Te. <i>s</i>		10 ⁰ Te. <i>s</i>
	14 ¹ En. <i>s</i>	24	1 ⁵ Mi. <i>s</i>		22 ⁴ Di. <i>n</i>
16	1 ² Mi. <i>n</i>		4 ⁴ Rh. <i>s</i>	4	8 ⁴ Rh. <i>w</i>
	3 ⁴ Di. <i>s</i>		8 ⁵ Di. <i>s</i>		8 ⁷ Te. <i>n</i>
	6 ⁶ En. <i>n</i>		11 ⁹ En. <i>n</i>	5	7 ³ Di. <i>s</i>
	6 ⁷ Rh. <i>w</i>		12 ⁸ Mi. <i>n</i>		7 ³ Te. <i>s</i>
	10 ² Te. <i>s</i>		22 ¹ Te. <i>n</i>		11 ⁵ Rh. <i>n</i>
	12 ⁵ Mi. <i>s</i>				

By means of this list of conjunctions approximate values of the rectangular co-ordinates x and y of the five satellites may be easily found for any other time t with the help of the following table, the argument of which is the interval τ of the time t and the time of the nearest preceding or following conjunction, the unit of x and y being the equatorial semi-diameter of the ball of *Saturn*. The satellites move in the direction of increasing position-angles, and are in the interval between a north and a south conjunction on the following side, and between a south and a north conjunction on the preceding side of the direction of the polar axis of *Saturn*. They are at their greatest elongation *Mimas* about 5'7, *Enceladus* 8'2, *Tethys* 11'3, *Dione* 16'4, and *Rhea* about 27'1 hours before or after the times of their conjunctions with the centre.

	<i>Mimas.</i>		<i>Enceladus.</i>		<i>Tethys.</i>		<i>Dione.</i>		<i>Rhea.</i>	
τ	x_1	y_1	x_2	y_2	x_3	y_3	x_4	y_4	x_5	y_5
0 ^h	0'0	0'7	0'0	0'9	0'0	1'1	0'0	1'4	0'0	2'0
1	0'9	0'7	0'8	0'9	0'7	1'1	0'6	1'4	0'5	2'0
2	1'7	0'6	1'5	0'8	1'4	1'1	1'2	1'4	1'0	2'0
3	2'3	0'5	2'2	0'7	2'0	1'0	1'8	1'4	1'5	1'9
4	2'8	0'3	2'8	0'6	2'6	0'9	2'4	1'3	2'0	1'9
5	3'1	0'1	3'3	0'5	3'2	0'8	2'9	1'3	2'5	1'9
6	3'1	0'1	3'7	0'4	3'7	0'7	3'5	1'2	3'0	1'8
7	2'9	0'3	3'9	0'2	4'1	0'6	4'0	1'1	3'5	1'8
8	2'5	0'4	4'0	0'0	4'5	0'5	4'4	1'0	4'0	1'8
9	1'8	0'6	4'0	0'1	4'7	0'4	4'8	0'9	4'5	1'7
10	1'1	0'7	3'8	0'3	4'9	0'2	5'2	0'8	4'9	1'6
11	...	...	...	...	5'0	0'0	5'5	0'7	5'3	1'6
12	...	...	...	...	...	...	5'8	0'6	5'7	1'5
16	...	...	...	...	...	...	6'4	0'1	7'1	1'2
20	...	...	...	...	...	...	...	...	8'2	0'8

Careful estimations of the times of the transits of the satellites across the prolonged polar axis of the ball are valuable for the determination of their orbital longitudes. *Mimas* and, after the end of March, also *Enceladus* are not observable at these times, as they are not outside the disc; their conjunctions with the ends of the ring take place about 3'0 and 3'2 hours before or after their conjunctions with the centre.

Ephemeris of the Satellites of Uranus, 1894. By A. Marth.

Greenwich Noon, 1894.	<i>Ariel.</i>					<i>Umbriel.</i>				
	P	α_1	b_1	$u_1 - U$	Diff.	α_2	b_2	$u_2 - U$	Diff.	
	°	"	"	"	°	"	"	"	°	
Mar. 2	272°36	14°56	+12°37	201°54	1428°40	20°29	+17°24	52°14	868°69	
12	272°47	14°68	12°45	189°94	34	20°45	17°35	200°83	63	
22	272°63	14°78	12°51	178°28	30	20°60	17°43	349°46	60	
Apr. 1	272°83	14°87	12°54	166°58	26	20°72	17°47	138°06	57	
11	273°06	14°94	12°55	154°84	22	20°81	17°49	286°63	54	
21	273°31	14°98	12°53	143°06	19	20°87	17°46	75°17	52	
May 1	273°57	15°00	+12°49	131°25	17	20°90	+17°40	223°69	51	
11	273°83	15°00	12°43	119°42	16	20°89	17°31	12°20	50	
21	274°08	14°97	12°34	107°58	15	20°85	17°19	160°70	50	
31	274°30	14°91	12°24	95°73	15	20°77	17°06	309°20	51	
June 10	274°48	14°83	12°13	83°88	16	20°67	16°90	97°71	53	
20	274°63	14°74	12°02	72°04	1428°18	20°54	16°74	246°24	868°55	
30	274°75	14°63	+11°90	60°22		20°38	+16°58	34°79		
	<i>Titania.</i>				<i>Oberon.</i>					
	α_3	b_3	$u_3 - U$	Diff.	α_4	b_4	$u_4 - U$	U	B	
	"	"	"	°	"	"	"	°	"	
Mar. 2	33°28	+28°27	244°83	413°48	44°50	+37°81	302°16	353°34	+58°16	
12	33°55	28°46	298°31	44	44°86	38°05	209°50	353°42	58°01	
22	33°78	28°59	351°75	40	45°18	38°23	116°80	353°53	57°79	
Apr. 1	33°98	28°66	45°15	37	45°45	38°33	24°07	353°67	57°50	
11	34°14	28°68	98°52	35	45°65	38°35	291°32	353°83	57°16	
21	34°24	28°64	151°87	33	45°79	38°30	198°55	354°01	56°78	
May 1	34°28	+28°54	205°20	33	45°85	+38°17	105°76	354°19	+56°37	
11	34°27	28°40	258°53	34	45°83	37°97	12°98	354°37	55°96	
21	34°20	28°20	311°87	35	45°73	37°72	280°20	354°53	55°56	
31	34°07	27°98	5°22	36	45°56	37°41	187°43	354°68	55°19	
June 10	33°90	27°73	58°58	39	45°33	37°07	94°68	354°81	54°87	
20	33°68	27°46	111°97	413°41	45°05	36°72	1°96	354°91	54°61	
30	33°43	+27°19	165°38		44°71	+36°36	269°26	354°99	+54°41	

The values of P, α , b , and $u - U$ being interpolated for the times for which the apparent positions of the satellites are required, the position-angles p and distances s from the centre of the planet are found by means of the formulæ :

$$s \sin (p - P) = \alpha \sin (u - U)$$

$$s \cos (p - P) = b \cos (u - U)$$

Since the Earth passed through the planes of the orbits in 1882, the only observations of the inner satellites which have come to my knowledge are the few measures, published in vol. iv. pp. 340, 341 of the *Bulletin Astronomique*, made by M. Perrotin in 1887, at a time when the apparent orbits were still too narrow to allow the satellites to be observed except not far from their greatest elongations or digressions. The apparent orbits are now sufficiently opened to allow the satellites to be seen in any part, and it is high time that good measures should be secured, before *Uranus* gets too far south for exact observing in northern latitudes. Cannot observers with powerful instruments be induced to contribute at least some good position-angles of the satellites during the present opposition?

A sidereal revolution of *Uranus* being performed in approximately 84 sidereal years, the apparent positions of the planet with regard to fixed stars recur very nearly after that period, so that the apparent path of *Uranus* during the present apparition differs only slightly from what it was in 1810. In the Berlin *Jahrbuch* for 1814 Bode represents in fig. 2 of the plate the path of the planet from 1810 April 26 to May 5, when it was near the stars 8 and 9 α *Libræ* (the 1 α and 2 α *Libræ* of Maskelyne's fundamental catalogue). On p. 167 Bode mentions that on April 29 he compared *Uranus* with 1 α *Libræ*, and found it just as bright, only somewhat paler.

Note on the Transit of Mercury over the Sun's Disc, which takes place for Venus on 1894 March 21, and on the Transits of Venus and Mercury, which occur for Saturn's System on the same day.
By A. Marth.

After an interval of thirty years, during which no transit of *Mercury* across the Sun has occurred for *Venus*, the first of a new group of transits takes place on March 21. The centre of *Mercury's* disc (of $20''.3$ apparent diameter) will enter upon the Sun's disc (of $1333''.7$ semi-diameter) for the centre of *Venus* at $10^h 48^m$ G. M. T. in pos. angle 21° (reckoned from the circle of ecliptical latitude), and will leave it at $14^h 30^m$ in pos. 319° , the difference of the parallaxes being $16''.4$, which data will be sufficient for a graphical representation.

Some hours before this transit both planets will have crossed the Sun's disc for *Saturn's* system, *Venus* entering as a spot of $2''.0$ diameter for *Saturn's* centre on March 20 at $18^h 50^m$ G. M. T. in pos. angle 34° , and leaving it on March 21 at $0^h 56^m$ in pos. 322° ; while *Mercury*, a tiny spot of only $0''.7$ diameter, enters at $5^h 9^m$ in pos. 11° , and leaves at $7^h 41^m$ in pos. 337° , the apparent semi-diameter of the Sun's disc being $99''.2$.

The following is a list of the transits of the planets since 1830:

Transits of Mercury for Venus.

	Helio. Longit.
1843 Feb. 28·7	203°4
1847 Feb. 27·8	21°5
1848 Sept. 13·9	206°9
1852 Sept. 12·5	23°8
1858 Mar. 29·2	26°1
1863 Oct. 12·9	28°5
1894 Mar. 21·5	202°2

Transits of Mercury for Saturn.

	Helio. Longit.
1835 June 15·2	202°0
Sept. 12·0	204°8
Dec. 9·9	207°7
1836 Mar. 7·7	210°5
1851 Jan. 5·2	20°6
Apr. 3·7	23°6
July 1·2	26°8
Sept. 27·7	29°9
Dec. 25·3	33°0

Transits of Venus for Saturn.

1835 Oct. 13·4	205°9	1864 Nov. 1·2	201°6
1836 May 30·0	213°2	1865 Jan. 29·0	204°5
1851 June 22·8	26°5	Apr. 27·9	207°4
1852 Feb. 7·6	34°6	July 25·8	210°2
1864 Sept. 7·7	199°9	1880 May 24·3	20°4
1865 Apr. 25·0	207°3	Aug. 20·8	23°4
Dec. 10·2	214°6	Nov. 17·3	26°6
1880 May 17·5	20°1	1881 Feb. 13·9	29°7
1881 Jan. 2·2	28°2	May 13·3	32°8
Aug. 20·0	36°3	1894 Mar. 21·3	201°2
1894 Mar. 20·9	201°1	June 18·0	204°0
Nov. 5·2	208°5	Sept. 14·9	206°9
1895 June 22·4	215°8	Dec. 12·7	209°7

Some hours before the occurrence of the transit of *Mercury* for the dayside of *Venus* on March 21, the nightside of the planet is favoured by another phenomenon of some interest—a partial eclipse of the satellite of the Earth. For those readers who may like to form some clear notions of the apparent positions of the Moon as seen from *Venus*, the following short ephemeris of the polar and rectangular co-ordinates of the Moon, referred to the Earth and its axis, may serve for a graphical representation:

Greenwich Noon. 1894.	<i>s</i>	<i>p</i>	<i>x</i>	<i>y</i>	<i>D</i>	<i>α</i>
Mar. 18	235°3	355°5	— 18°4	+ 234°6	45°3	12°3
19	289°6	67°9	+ 268°4	+ 109°0	44°6	12°1
20	531°2	92°1	530°9	— 19°5	43°9	11°9
21	769°8	100°7	756°4	143°4	43°1	11°7
22	970°1	105°3	935°7	256°0	42°4	11°5
23	1119°5	108°3	1062°8	351°8	41°8	11°4
24	1213°0	110°6	+ 1135°3	— 427°0	41°1	11°2

D and d are the apparent diameters of the Earth and Moon, their greatest defects of illumination on March 21 being $4''.7$ and $1''.3$ in position-angle 106° .

The corresponding data for the Moon's position, as seen from *Mercury*, are :

Greenwich Noon. 1894.	s	p	x	y	D	d
Mar. 18	459.0	305.2	-375.2	+264.4	29.1	7.9
19	263.9	311.6	192.6	175.5	29.0	7.9
20	76.3	354.0	-8.0	+75.9	28.8	7.8
21	180.3	98.5	+178.6	-26.7	28.6	7.8
22	371.5	109.7	349.8	125.1	28.3	7.7
23	540.2	113.2	496.5	212.8	28.0	7.6
24	674.7	115.1	+611.5	-285.2	27.6	7.5

The greatest defects of illumination on March 21 are $0''.4$ and $0''.1$ in position-angle 104° .

But *Mercury* is favoured at the same time by a grander sight—the aspect of brilliant *Venus* near *Saturn*. On March 21, at $14^h.3$ G. M. T., *Venus* comes within one degree of *Saturn*, approaches it most closely on March 22 at $16^h.5$, at a distance of $25'$, and reaches again the distance of one degree on March 23 at $18^h.8$. The apparent motions of both planets are retrograde, the conjunction being the middle one of three conjunctions occurring during the same synodical revolution. While, during this second conjunction, *Saturn* will appear for *Mercury* of about the brightness which it will have for the Earth in the middle of June, *Venus*, with an apparent diameter of $57''$ or more, will appear for *Mercury* eight times as brilliant as it appears to the Earth when at its greatest brilliancy: this occurs just at the same time.

Col. Cooper's Observatory :
Markree, Collooney, Ireland.

Second List of Corrections of "Galactic Longitudes and Latitudes"
in vol. liii. By A. Marth.

Vol. 53, p. 384	182°26' - 1°37' lat. should be	-0°37'
385	187°46' - 2°28' „ „	-2°88'
387	199°77' + 6°16' should be	199°96' + 5°48'
„	201°04' - 9°35' „ „	201°19' - 8°99'
389	208°86' - 4°99' long. should be	203°86', so that the position ought to have been inserted on the preceding page
394	235°08' - 6°31' should be	234°66' - 6°81'
„	237°90' - 78°89' lat. should be	-7°89'
406	300°40' + 10°74' „ „	-10°74'
409	319°09' - 12°93' „ „	+12°93'
414	347°80' - 9°46' long. „	347°20'

Mr. Ant. Pannekoek, of Leiden, has been good enough to comply with my request on page 420, and has pointed out these errors, except the fourth, for which I have to thank Professor J. de Moraes Pereira, of S. Miguel, Azores, who had also remarked the fifth error.

Erratum in Mr. Jacoby's paper on 61 Cygni, in *Monthly Notices*, vol. liv., p. 117, line 21 from bottom :

for such *read* each.

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